MOTOR AGE

Vol. XXX
No. 7

CHICAGO, AUGUST 17, 1916

Ten cents a copy
Three dollars a year

Why I am a Studebaker Dealer

After selling out my interest here in one of your competitive lines which I have been handling for the past seven years, I went to Detroit and the other manufacturing centers and looked the field over thoroughly, going through the different factories, and was most impressed with the wonderful manufacturing facilities that you incorporate in your car. Not only was the mechanical end the best I saw, but the finish on your cars, and all the little details were worked out, and the car itself was much ahead of anything in this priced class.

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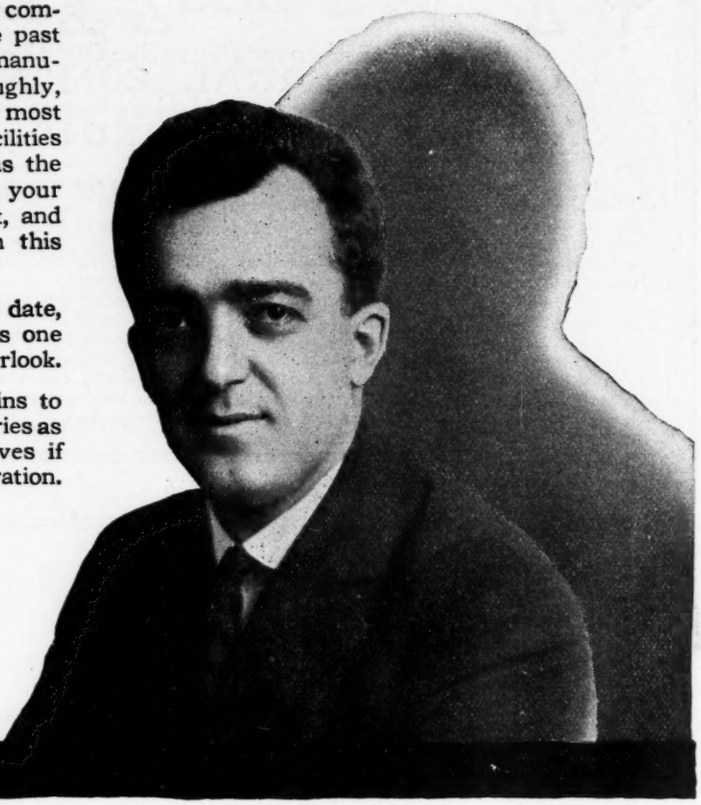
Our sales have been most flattering and it begins to look now as though it is only a matter of deliveries as the new Series 17 cars practically sell themselves if you can once get the customer to take a demonstration.



Pres. Kirkland-Dailey Motor Co.
Kansas City, Mo.

Studebaker

IT takes a mighty good proposition now-a-days to induce a dealer to change over from one make of motor cars to another. The margin of profit allowed on each sale is secondary to the subject of value that a car gives, its reputation for performance, and the things said about it by people who have used it.

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We have some interesting facts to send—if you'll write for them.

STUDEBAKER

South Bend, Indiana **Detroit, Michigan** **Walkerville, Ontario**

Address all Correspondence to Detroit

Vol. XXX No. 7 Chicago, August 17, 1916 $3.00 Per Year

MOTOR AGE

Hillclimb Conquers Pikes Peak

Lentz in Romano, Mulford in Hudson, and Junk in Chalmers Divide Honors in Three Events — Spectacular Driving Among Clouds New Sensation

HOW THEY FINISHED

TROPHY EVENT

Car	Driver	Time	Prize
Romano	Lentz	20:55.6	$2,000*
Hudson	Mulford	21:40.5	1,000

231 TO 300 CUBIC INCHES

Hudson	Mulford	18:24.7	$500
Duesenberg	Buzane	23:48.4	250
Mercer	Parish	28:31.8	150

231 CUBIC INCHES AND UNDER

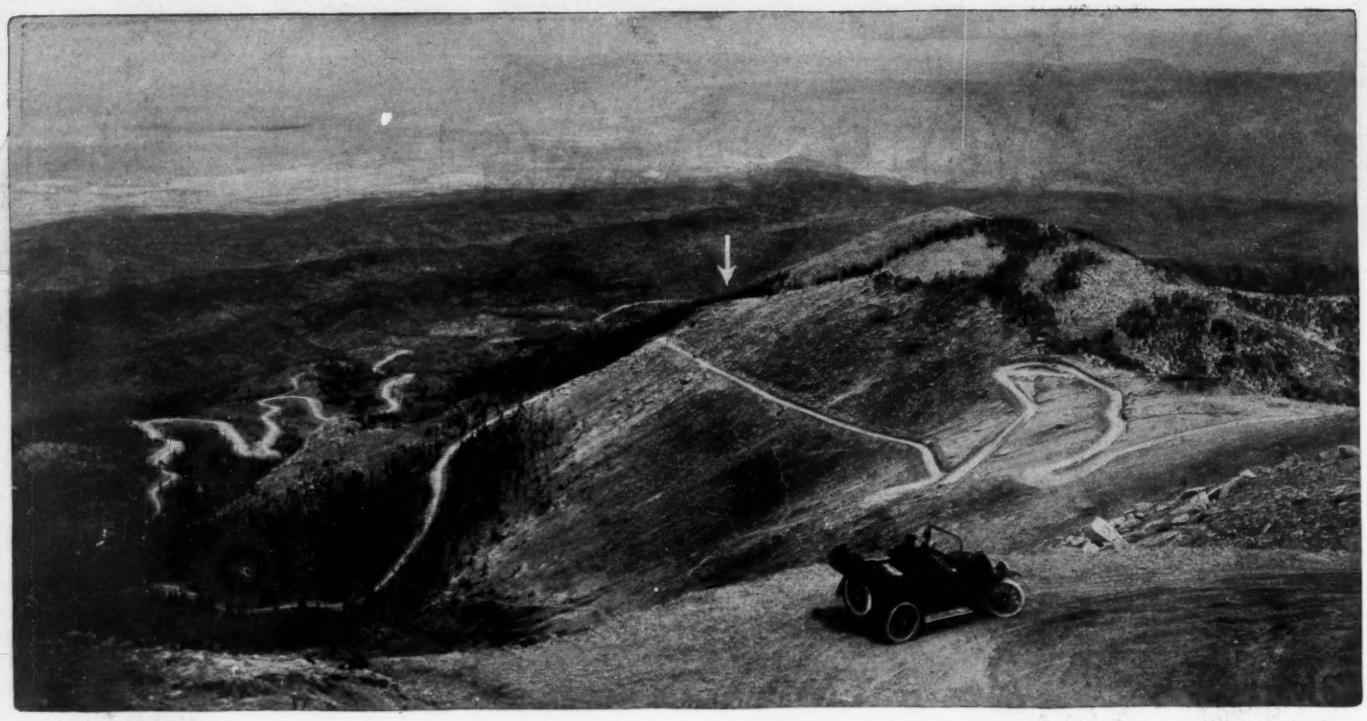
Chalmers	Junk	23:04.6	$500
Chalmers	Stentz	23.29.9	250
Grant	Jones	26:05.3	150

*Also Penrose cup.

By H. G. Hedden

COLORADO SPRINGS, Colo., Aug. 12—The quarter-million-dollar highway to the summit of Pike's Peak was dedicated with fitting thrills this afternoon when Rea Lentz, driving E. J. Romano's eight-cylinder special Romano car, whirled through rain clouds and above year-round snow in a violent electric strom and won the $1,200 Penrose trophy and $2,000 cash prize in the star event of the first annual hillelimb on the world's highest motor road. Ralph Mulford, winner of the main event on yesterday's program, captured the remaining $1,000 prize in a Hudson Super Six special, while the field included such other drivers as Hughie Hughes, Barney Oldfield, George Buzane and Harold Brinker, along with fast-time winners of prize money in yesterday's contests for size-limited motors. Lentz's time was 20:55.6 for the climb of 12 miles and 2,200 feet, or 35.3 miles per hour, and Mulford's time was 21:40.5.

Although today's free-for-all was the big event of the 2-day meet, the best time



Bird's-eye view of the Pike's Peak highway around which climb was made. Arrow indicates start; finish line is 4 miles above the W. Note how the course zig-zags on its way up the mountainside to get an easy grade. Nowhere does it exceed 10½ per cent

was made yesterday in the contest for cars with piston displacement of 231 to 300 cubic inches, which was won by Mulford in 18:24.7, or 40.8 miles per hour. The slower time today was due mainly to the heavy storm near the top of the course during the latter part of the contest. The last group of drivers yesterday had to come down in a heavy downpour of rain, but the storm did not break until the last car had crossed the finish line.

Original Entries Thirty

The original entry list for the main event contained 30 cars, but eleven dropped out on account of accidents in yesterday's races or in trial climbs, carburetion trouble, inability to get suitable gearing, and other hindrances, and today's entry list was nineteen. Then Hughie Hughes found it impossible to get his Duesenberg repaired after breaking the crankcase and otherwise badly damaging his motor yesterday, and he arranged to drive A. H. Patterson's Hudson in place of Patterson, who was suffering from a badly swollen face due to neuralgia, thus bringing the number of machines actually starting down to eighteen.

Six of today's entrants failed to finish, and the remaining ten besides Lentz and Mulford finished in the following order:

Driver and car	*Time*
Junk, Chalmers	22:46
Brinker, Cadillac	22:51
Hughes, Hudson	22:55
Mortenson, Cadillac	23:30
Jones, Grant	25:42
Knowles, Ford	26:20
Peterson, Ford	26:22
Stentz, Chalmers	26:28
Morgan, Studebaker	28:23
Oldfield, Delage	29:27

The six who failed to finish were Buzane, in a Duesenberg; Hughson, in a Pathfinder; Parish, in a Mercer; Wetmore, in a Saxon; Worthington, in a Maxwell, and Henry in a Ford. Minor accidents were the cause.

Following Mulford in the Friday contest for cars with piston displacement of 231 to 300 cubic inches were:

Driver and car	*Time*
Buzane, Duesenberg	23:48.4
Parish, Mercer	28:31.8
Oldfield, Delage	31:38.6

Patterson, Mulford's teammate, with the other Hudson Super Six, finished second in 22:15, but his record was not allowed because he swerved outside of the course on a bad curve just below the finish line. Patterson had a lot of hard luck in the trials, also, and his genial and game spirit won many friends. This afternoon he stepped out and gave his car over to Hughes because the latter's Duesenberg was beyond repair in time for the race. Hughes was making good time in the No. 2 event yesterday afternoon when his motor was put out of commission near the eighth mile by a broken piston, broken feed pipe, broken crankcase and other damages. It would practically have required a new motor for today's race.

The first event, which was for cars with piston displacement of 230 cubic inches

Motor Sizes, Gear Ratios and Equipment Used by Cars in Pike's Peak Climb

Car	*Driver*	*Bore*	*Stroke*	*No. Cyl.*	*Carbureter*	*Ignition*	*Spark plugs*	*Oil*	*Shock absorbers*	*Tires*	*Wheel*	*Gear ratio*	*Other equipment*
Hudson	Mulford	3.5	5.0	6	Hudson	Delco	Rajah	Castor	Hartford & Gabriel	Silvertown	R.-W.	4.9 to 1	Moto-Meter
Hudson	Patterson	3.500	5.000	6	Hudson	Delco	Rajah	Castor	Hartford & Gabriel	Silvertown	R.-W.	4.9 to 1	Moto-Meter
Duesenberg	Buzane	3.980	6.000	4	Schebler	Bosch	Rajah	Castor & Oilzum	Hartford	Silvertown	R.-W.	2.75 to 1	Moto-Meter
Duesenberg	Hughes	3.750	6.750	4	Miller	Bosch	Rajah	Harris	Hartford	Silvertown	R.-W.	4.5 to 1	Moto-Meter
Chalmers	Junk	3.125	5.250	6	Stromberg	Bosch	Rajah	Harris	Hartford	Silvertown	Houk	3.75 to 1	Moto-Meter
Chalmers	Stentz	3.250	4.500	6	Stromberg	Bosch	Rajah	Mobile A	Hartford	Silvertown	Houk	5 to 1	Moto-Meter
Grant	Jones	3.000	4.250	6	Stromberg	Bosch	Readhead spcl.	Harris	None	Firestone	Wood	4.25 to 1	Moto-Meter
Mercer	Parish	3.250	6.250	4	Master	Bosch	Reflex	Duplex	Hartford	Republic	R.-W.	4 to 1	.....
Cadillac	Brinker	3.125	5.125	8	Cadillac	Delco	Rex	Harris	None	Goodyear	Houk	5 to 1	Moto-Meter
Cadillac	Mortenson	3.025	5.125	8	Cadillac	Delco	A-C	Harris	None	Silvertown	R.-W.	5.5 to 1	Moto-Meter
Delage	Oldfield	3.740	6.290	4	Miller	Bosch	Rajah	Harris	Hartford	Firestone	R.-W.	3.75 to 1	Moto-Meter
Romano	Lentz	4.000	4.000	8	Master	Mea	Pugon	Harris	Romano	Firestone	Wood	2.63 to 1	Moto-Meter
Pathfinder	Hughson	2,875	5.000	12	Stromberg	Delco	Rajah	Harris	Hartford	Silvertown	Houk	5 to 1	Moto-Meter
Saxon	Wetmore	3.000	4.500	6	Rayfield	Atwater-Kent	Rajah	Monogram	Hartford	Silvertown	Houk	5 to 1	Moto-Meter
Studebaker	Morgan	3.875	5.000	6	Master	Remy	Splitdorf	Harris	Hartford	Goodyear	Wood	4.5 to 1	.....
Maxwell	Worthington	3.675	4.500	4	Master	Bosch	Molite Jombo	Harris	Hartford	U. S.	Houk	3.58 to 1	Moto-Meter
Ford	Knowles	3.750	4.000	4	Master	Bosch	Champion	Mobile A	None	Goodyear & Michelin	Wood	4 to 1	.....
Ford	Peterson	3.750	4.000	4	Master	Bosch	Champion X	Harris	None	Michelin	Wood	4 to 1	.....
Ford	Henry	3.750	4.000	4	Holly	Atwater-Kent	Champion X	Harris	None	Michelin	Wood	4 to 1	.....

Junk in Chalmers making a turn on the W's

Stentz in Chalmers finishing in second place in event 2

and under, was won by Fred Junk in a Chalmers special, in 23:04.6. His teammate, Roy Stentz, driving a duplicate of Junk's machine, won second place in 23:29.9, with Henry Jones third in a Grant in 26:05.3. The others finished as follows:

Driver and car	*Time*
Peterson, Ford	28:00.3
Wetmore, Saxon	28:43.4
Knowles, Ford	29:25.7
Spangler, Ford	36:58.8

Walter Henry, in a Ford, ran into the ditch on the fifth mile of the course, while Worthington, in a Maxwell, made the crowd at the upper parking place hold its breath when he crashed into the bank on the sharp W curve near the eighth mile, at an elevation of 13,000 feet.

Mulford's time of 18:24.7 in event No. 2 is regarded the more remarkable because he lost a minute and a half at the ninth mile when he had to stop to adjust his carbureter.

Course Is Ideal

Racing experts declare this corkscrew highway an ideal course to test the skill of the driver even more than the speed and endurance capacity of the car, on account of the steep grades and severe curves, the difficulty of learning such a course and the perplexing requirements in respect to gearing and other factors. The lack of spectacular brushes such as are afforded by speedways is largely counterbalanced by the driver's problems, the unique feat of driving to the 14,109-foot summit of this famous mountain named after the noted ox-team explorer who visited the gigantic sentinel of the Rockies a century and ten years ago, and by the wonderful view of 60,000 square miles of mountains and plains from the uppermost parking place above timberline and only 1,275 feet below the top of the peak.

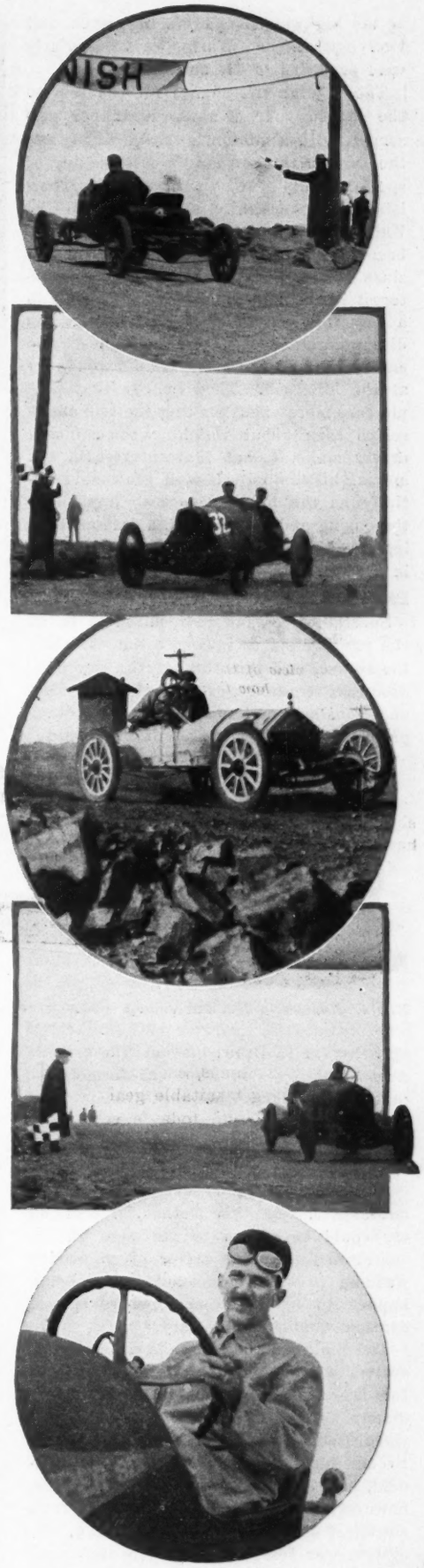
The course has sixty curves, an average grade of 7 per cent and a maximum grade of 10.5 per cent. It is of double track construction throughout, ranging in width from 20 to 50 feet. It is surfaced with crushed granite, lava rock and other mountain rock having a tendency to crush and cement together readily, and is almost entirely free from dust. The road drains readily and gives scarcely any trouble immediately after a heavy rain. It was blasted out of the solid rock of the mountainside, took a little over a year to build, and cost $250,000.

The entire highway on the mountain is a little more than 18 miles in length, but the races were started 6 miles from the beginning of the road, thus making the actual course approximately 12½ miles long—12 miles, 2,220 feet.

Weather Is Freakish

While the freakish weather at the summit is sometimes rather unpleasant, yet visitors usually overlook hardships incident to an experience of being in or above clouds in a storm of rain or snow, watching the lightning play about the rocky summit, seeing rainbows against nearby slopes and witnessing other pranks of nature to be found only in the mountains. There was a heavy snowstorm on the peak Wednesday, when the motorcycle events were on.

Parking places for spectators were provided right at the starting point, at intervals along the first mile or two of the course, at the Glen Cove amphitheater 5 miles from the starting place and on a vast slope near the course at the eighth mile. This highest point gives a view of almost the entire 8 miles below, and also several stretches of the remaining part of the 4 miles above. No grandstands were provided anywhere, as most of the spectators could see well from their cars or find comfortable viewpoints on the rocks or on blankets spread over the slopes of moss and wildflowers, but the highest parking place was equipped with 125 unsheltered platform boxes scattered about where they would furnish the best view, a few of which were taken by well-to-do people at $25 a box. In fact, the crowds were sadly small, although there were hundreds of parties in their own cars from all parts of the country, who paid $3 per passenger toll and $5 per car for parking space, and scores of visitors who paid $10 apiece for transportation and admission



Top to Bottom—Jones in Grant six finishing in third place in event 1; Buzane in Duesenberg finishing second in event 2; Lentz in Romano winner of big event; Parish in Mercer, third in event 2; Patterson in Hudson

in the highway company's big seven and twelve-passenger White cars regularly used for trips to the summit.

The regular toll charge for the trip to the top in your own car is $2 per passenger, with a minimum charge of $4, and the fare in the company's cars outside of special events is $6.50 per passenger. Tourists from practically every state in the Union and from foreign countries have been taking this thrilling motor trip ever since the road was completed, and the interest in the highway itself is growing in a way that offsets to a great extent the disappointment of the promoters of the enterprise in the rather small attendance at the hillclimb. They believe that people care more about making the trip themselves than about watching some racing driver make it, but that interest in the annual hillclimb itself will grow substantially as the public comes to appreciate the daring and skill of such a feat as driving a car over this only course of its kind in the world in 20 minutes or less.

Patrol of Course

Spectators' cars were required to be at the parking places in ample time to clear the course, and the work of the few hundred cars required a great deal of planning and constant vigilance. This and other problems were in the hands of Traffic Manager Nelson L. Drew, of the Pike's Peak Auto Highway Co., who was formerly a railroad man, and who works like a Mallet locomotive pulling a heavy train through the mountains.

Hughie Hughes in the Duesenberg which went out above timberline

The course was patroled by a telephone system, flagman and several motorcycle messengers. By this method, a disabled car could be gotten to the edge of the course and the next driver given needed warning in case the disabled car should happen to be on a curve where special caution would be necessary.

The timing method was the same electric system worked out by Chester S. Ricker for the Marmon 1,000-mile trial at Indianapolis a year and a half ago, and since used at the Chicago match race between Resta, Cooper, Burman and Oldfield, and at other speed contests. Here, however, to guard against an upset from electrical disturbances on the peak, the system was tested before each start, and was also supplemented by a wig-wag patrol system across prominent points to prevent a driver from traveling far in case of failure to record his starting time.

The cars in the different events were started 5 minutes apart, and were run in groups of four, each group being held until the last car of the preceding group had crossed the finish line.

Mulford speeding near top of peak

The hillclimb was refereed by Ralph W. Smith, Colorado vice-president and member of that body's contest board, and the position of honorary referee was given to Spencer Penrose, donor of the rich trophy of Colorado silver and gold won by Lentz. The chief timer was Chester S. Ricker, of Indianapolis, and the chief starter, Dean M. Gillespie, Rocky Mountain district manager for the White Motor Co. Paul Franklin, George Buzane's manager, was clerk of the course, and the general director of contests was M. W. Colwell, New York.

Being the first event of this kind attempted by the promoters, and having so many exceptional and untried factors, with the many technical and other problems involved, the events were not run through quite on schedule or as smoothly as the officials wished, but everybody praised the race course and the enterprise of making such a hillclimb possible, and all predict a bigger field of entries next year. When a wrangle was threatened, it was frequently laughed aside.

The hillclimb was one of wide interest from a society standpoint, also, as the social season is now at its height here in America's world-famed "Little Lunnon."

Pete Mortensen in near plunge off the course in a Cadillac

Lentz will be permitted to keep the $1,200 Penrose trophy 11 months, when it must be returned to the highway company for next year's classic. By winning the cup three times, an entrant can gain permanent possession.

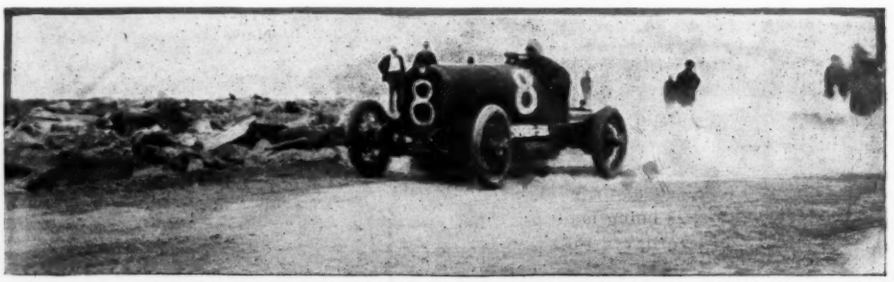
ROSS IN HIGH GEAR CLIMB

Denver, Colo., Aug. 12—With his high gear locked in place by the motor editor of the Rocky Mountain News, who was a passenger in the car on the run, Casey Hamilton, of the Midwest Auto Sales Co., this city, drove a Ross eight car over Lookout Mountain, Colo. This is a climb which is considered good when made on low gear. The Ross eight carried seven passengers with a total weight of 1,103 pounds.

FIRST VANDERBILT ENTRANT

Santa Monica, Cal., Aug. 12 — Barney Oldfield is the first entry in the Vanderbilt cup and international grand prize races to be held here on November 16 and 18. Much mystery is attached to the entry owing to the fact that Barney has not named the car he intends to drive.

It is said that a team of five Mercers will be entered by George Bentel within the next 10 days. That three of these cars will be the new 300-cubic inch displacement creations is the statement of a man here who is in close touch with Mercer interests. It is thought that the team will be captained by Eddie Pullen.



Ralph Mulford near top of peak in event 2

Chicago Has 14 Entries

High Speed Eliminations for American Speedway Grand Prize

De Palma Will Try for World's Hour Record on Thursday

CHICAGO, Aug. 15—When the elimination trials open tomorrow, fourteen cars will attempt to qualify for the American Speedway Grand Prix race to be held here next Saturday. These trials will continue Thursday and Friday, and it seems probable that, from past performances of the majority of the entry list, the requisite speed of 100 miles per hour will be attained, and that when the cars are lined up before the starter at 2 o'clock next Saturday afternoon, the total number to participate will be practically the same as the entry list.

Entries to date include two Packards, one of which has been entered by Ralph de Palma, along with his Mercedes, and it is not known at present whether Ralph will enter the race next Saturday driving a Packard, or the car which has served him both well and uncertain in various races for several years—the Mercedes. This leaves one Packard with the driver unnamed.

Field Looks Fast

Dario Resta's Peugeot is here, and he is expected to arrive today. The Hoskins Special, which Eddie O'Donnell drove at Kansas City will be driven by George Buzane, as O'Donnell's broken arm is not healed sufficiently to allow him to participate. Ralph Mulford has wired his entry of the Peugeot and the Hudson Super Six. The latter he is bringing to Chicago from Colorado Springs, and the Peugeot is being shipped here from New York.

An entry which is looked upon as a dark horse is a Ben-Hur car, to be driven by Jackson, about whom little is known. The Bur-Hur car is one that has been built for the Chicago Speedway Association, and two or three of these were to have been ready for the Chicago race, June 10. This will be the first appearance of one of these cars.

Among the other entries are: D'Alene's Duesenberg, Milton's Duesenberg, Christiaens' Sunbeam, and Galvin's Sunbeam, Lewis Chevrolet's Frontenac, and another Hoskins' Special to be driven by Eddie Rickenbacher, this car being a duplicate of O'Donnell's car and owned by C. C. Hoskins, a Kansas City sportsman.

As an added feature of Thursday's practice and elimination, de Palma will attempt to lower his American 1-hour record of 94 miles with the Mercedes, or one of the Packards. An effort is being made to have the final heat of Saturday's race made a championship event so that those who finish inside the money may add to their score in the Bosch and Goodrich prize award, but if the contest board of the A. A. A. allows this, it will be necessary to double the length of the final heat, making it 100 miles instead of 50.

SIX ENTRIES FOR INDIANAPOLIS

Indianapolis, Ind., Aug. 14—Gil Anderson and Howdy Wilcox have entered their Premiers for the harvest racing festival on September 9. These with Christiens' Sunbeam brings the total to six cars entered in September 9 event. Two Peugeots, with Aitken and Merz at the wheels and the Ostewig special with S. Ostewig driving, are the other entries received.

MILACS FOR VANDERBILT

Los Angeles, Cal., Aug. 12—The first of the new 300-cubic inch Milacs is now under construction here and will be ready in a few weeks. The car is being built for Frederick Robinson of this city and will make its first appearance in competition in the Vanderbilt cup and international grand prize races at Santa Monica on November 16 and 18. The derivation of the name Milac is from the initials of the words in the slogan of the car, "Made in Los Angeles, Cal."

ROONEY STILL IN HOSPITAL

Indianapolis, Ind., Aug 15—Tom Rooney, driver of the Premier race car which injured him in the 300-mile race last May on the Indianapolis motor speedway, still is in the hospital here suffering from a broken leg. The injury refuses to heal properly and the bone has refused to knit. Although he is resting well there is no possible chance that he will be able to appear at the wheel of a race car this fall.

Racing Events

*August 19—American speedway grand prize, Chicago.
*August 26—100-mile track meet, Kalamazoo, Mich.
*September 1-2—24-hour race, Sheepshead Bay.
September 4—Track meet, Newark, N. J.
*September 4—Speedway race, Cincinnati, Ohio.
September 4—Track meet, Elmira, N. Y.
September 4—Des Moines, Ia., speedway race.
September 4-5—Track meet, Spokane, Wash.
*September 4—Cincinnati speedway race.
*September 9—Indianapolis speedway race.
September 16—Speedway race, Providence, R. I.
September 18—Track meet, North Yakima, Wash.
September 29—Track meet, Trenton, N. J.
September 30—New York, Sheepshead Bay speedway race.
October 7—Philadelphia speedway race.
October 7—Omaha speedway race.
October 14—Chicago speedway race.
October 19—Indianapolis speedway race.
October 21—Track meet, Kalamazoo, Mich.
*November 16—Vanderbilt cup race, Santa Monica, Cal.
November 18—Grand Price race, Santa Monica, Cal.
November 30—Speedway, Los Angeles, Cal.
December 25—Speedway, Los Angeles, Cal.

*Sanctioned by A. A. A.

Lottery for Road Funds

Tennessee Once Used This Means to Get Money for Roads

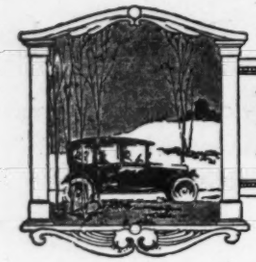
"Pay Your Toll or Lose Your Scalp," Tollgate Sign

NASHVILLE, Tenn., Aug. 12—Although the establishment of a state highway commission and the construction of roads by state aid is only a few years old in Tennessee, it has been discovered by Assistant Secretary O. M. West, of the highway department, that the first steps along this line were taken more than 100 years ago, in a pioneer move in road building. The state aid at that time was provided not by motor licenses but by the sale of lottery tickets and the funds secured by this unholy means were used to construct part of the present Bristol-to-Memphis highway across the state. This road also marks one of the first steps in coöperation between the government and the state in road-building, for all surveys were made by the federal government.

This road was a link between the Cumberland Valley and the city of Washington, crossing the Cumberland mountains. This region was then the hunting grounds of the Chocktaws, Cherokees and Creek Indians and the entire state of Tennessee was part of North Carolina. The roads to the east were the Buffalo trails and when this section became populated by white men who had many battles with the Indians, the legislature passed a bill providing for the construction of a more direct road and a lottery from which the funds should be derived. Before the road was actually under construction, the territory was ceded to the federal government. An agreement was made with the Indians, one clause providing for the construction of this road with a federal survey. There was some delay in carrying this out and the Indians contended that until this was done the white men had no right to cross this territory without special permit. The first toll-gate in the state was placed by an Indian chief and a phrase which has become famous was then originated, this being, "Pay your toll or lose your scalp." This was torn down by troops.

OLD RACE DRIVER KILLED

Dallas, Tex., Aug. 12—James Cerrigan, one-time racing partner of De Hymel, was instantly killed near San Antonio, August 7. He was racing up a hill for a moving picture camera when the accident occurred. There was no one in the car with him and when A. S. Graham, a friend, and C. O. Lee, camera man, reached him he was dead. He was climbing a steep hill at a terrific rate of speed and the idea was to get a picture as he came over the hill.



EDITORIAL PERSPECTIVES

The Woman in the Car

CONSIDER the motor car today and how it shines and takes pride in itself because of its polish and ultra finish. As a snob it might run a close race with even the most proverbial of the F. P. T's, meaning the First Products of Today, among which we have with us gasoline, leather and wheat. When taken to account for its growing ease and general comfort, the car uses the common excuse and says, "The woman did it!"

NOT one is so amiss as to omit the features which have helped turn the carryall into a family car and the country jog behind Dobbin into a transcontinental tour with all the comforts of home. Most of the features—take the specially tilted seat, the starting and lighting systems and other things of like nature —are real necessities today, but the cars of several years ago got along very well without them until the woman became a factor in the car.

MUD splashed on the feminine occupants of the car was apt to bring a reputation of poor driving to the masculine driver; narrow doors invariably caught wide skirts; the seats were not comfortable—and when the woman started to driving! First, the open front of the car went; then the doors were changed. The seats have been raised and lowered and tilted and jilted and put to all sorts of acrobatic stunts to find the most delectable angle. Starting and lighting systems were hastened in their coming. The tire pump found its connection with the motor more quickly than it would have if it had not been for the woman driver. Steering wheels were made so that they could be turned out of the way, in some instances, and entrance and departure, in general, made easier. At one time, large hats made limousine doors larger.

THE result is more efficiency and more satisfaction, whether the car figures in a trip to town or a grilling run cross-country. Both men and women find the new season's model more individual and personal, and it is not too far fetched to say, "The woman did it!" here, for the greater part of the changes in the car body have been those conducive to the comfort of the woman in the car.

Transcontinental Records

THERE has been too much bungling in connection with dark-horse motor records. Transcontinental records have suffered particularly in this respect. So general are criticisms regarding such records that there is scarcely a transcontinental mark that has not been questioned. For several years this has been the case and it will continue to be so until such time as those going after transcontinental records announce well in advance that such an attempt is being made.

STARTING out for the transcontinental record with the understanding that if you do not accomplish the task nothing will be said, and if you accomplish it the usual news will be given out, is a kind of safe-and-sure policy, and it may be a strong-box business policy, but it is a poor sporting policy. It is a policy diametrically opposed to the best interests of motor sport. It is a policy that is ideal for creating an atmosphere of doubt, uncertainty and distrust. It is a sure roadway to destroying that desirable spirit surrounding sporting events.

LET us have attempts at records duly announced in advance, so that any person desiring to follow the progress of such can do so. Let the public know, and that public will be the best jury as to the acceptance of such a record. More attempts at the transcontinental record are to be made. Let those makers contemplating such make their announcements in advance. If they fail, they should be willing to take an criticisms that come. If they succeed, greater honors are theirs.

OUR great engine tests have been announced in advance. It has been possible to watch them as they progress. So it should be with transcontinental records. So it should be with tests on our speedways; so it should be with all tests that are intended to compete against others made publicly. Anything that savors of secrecy in connection with a test generally works ill towards the results. The winner is robbed of that untarnished lustre which the performance should merit. Let all motorcar makers trying for new transcontinental records make their plans public before they start.

Interpret Speed Violations

THE report of the first month's operation of the new traffic court in New York, which was started to take over all arrests for motorcar speeding, and other violations of the motorcar code, shows that the new court is simply a centralized one to exact the same fines that have been exacted in the different justice shops during several past years. The first month's record does not give indications of any general movement to correct the situation. Apparently the motorcycle police are still just as eager to make arrests and go a little ahead of their schedule of arrests for the corresponding period a year or so ago.

IF traffic courts for handling violations of the motor car ordinances are to have a beneficial influence, further than exacting $18,000 tribute a month from motorists, those in charge of them must make a profound study of existing conditions and do something more than asking the usual question if you were traveling over a certain speed or not.

THE New York report shows that there are very few cases of first offenders being let off with a warning. Unfortunately, the New York court turns a deaf ear to such. The court apparently considers that its main job is to assess fines of $25 or $50, as the case may be, for speed violations. These special courts will never accomplish anything if they are just clerical justice shops to exact fines in accordance with the letter of the law rather than interpreting violations with regard to the spirit of the law and the spirit of the alleged offenders.

IF motorists are confirmed speed ordinance violators, then either the speed ordinances are irrational, or the motorists are more or less innate criminals. Let us get at the truth in either case. Just going along assessing fines according to the wording of the law is not getting anywhere. If there is an abuse, let it be remedied. Motorists should be as anxious as justices to do such. Do not let us continue to live year in and year out under a law that is not right, or that is not being administered as rationally as it should be.

Should Have Had His Idea Patented

New Yorker Damages Cars then Repairs Them, but Gets Caught

NEW YORK, Aug. 12—It's a hard world, this, for a working man. As fast as a fellow thinks up a way to make a living, says the Telegraph, along comes somebody of perverse views and—away goes the newly founded profession in a cloud of smoke.

For instance, one enterprising mechanic with a strain of originality had been plying his novel business on Forty-fourth street in front of Keen's chop house for the last month until Wallace Eddinger, the actor, happened along late one night—and the mechanic is now conjuring up some new way to provide himself with daily meal tickets.

For the last month motorists dining at Keen's have noticed an unwonted attitude of malcontent about their cars when they emerged from the restaurant, and invariably it required the services of a handy bystander before the balking engine could be persuaded to do its work. No one chanced to observe the fact that the handy bystander, in every instance, was the same man. It remained for Eddinger to do that.

As the latter left the theater he noticed a man tinkering with the engine of one of the cars that stood in a long line outside Keen's chop house. He rushed over and seized him before the self-appointed mechanician could make his escape. Further investigation served to prove the man was disconnecting two very essential parts of the engine, and when the motorists had been called out to view him several of them recalled his having assisted them in starting their cars during the last few weeks.

I AM A TACK—BEWARE!

I am a tack. I was made in a great factory for small purposes. In my ordinary life, therefore my attainments are small, even though I sometimes rise to point of suspending some dear one upon the wall in the hall of fame. More often I simply hold in place the carpet upon which the humans walk and have to be content to be trodden under foot.

No attention is given me until I get the chance to go upon the highways of life, when the great monster, the motor car, travels at speeds too great for such as I. Although they are a thousand times greater than I, sometimes I check the motor's progress and they wonder from whence I come, but I never tell. Often I am called "hard luck" in disguise but more often I am termed things which are spoken in muffled tones and not in the presence of ladies.

I cause men to perspire—to soil the clothes for which they labored to buy. Sometimes when I suddenly dart into the immense and expensive tires, I am hard to find, but I always manage to release the imprisoned air. Then my life work is accomplished. Very often the careless driver, after finding me, throws me again into the road and again I get the chance to do my work. I am a tack—look out for me or I will cause you unthought of delays. My head is broad, upon which to stand—my point is sharp with which to stick. I am a tack—BEWARE!

SPEED LIMIT 115 MILES

Sioux City, Ia., Aug. 11—"City limits. Limit speed to 115 miles an hour." Thus read a series of new signs on the paved motor roads leading into Sioux City, which have recently been completed. The police found boys had added another digit to each of the signs.

GOT HIS SIGNALS MIXED

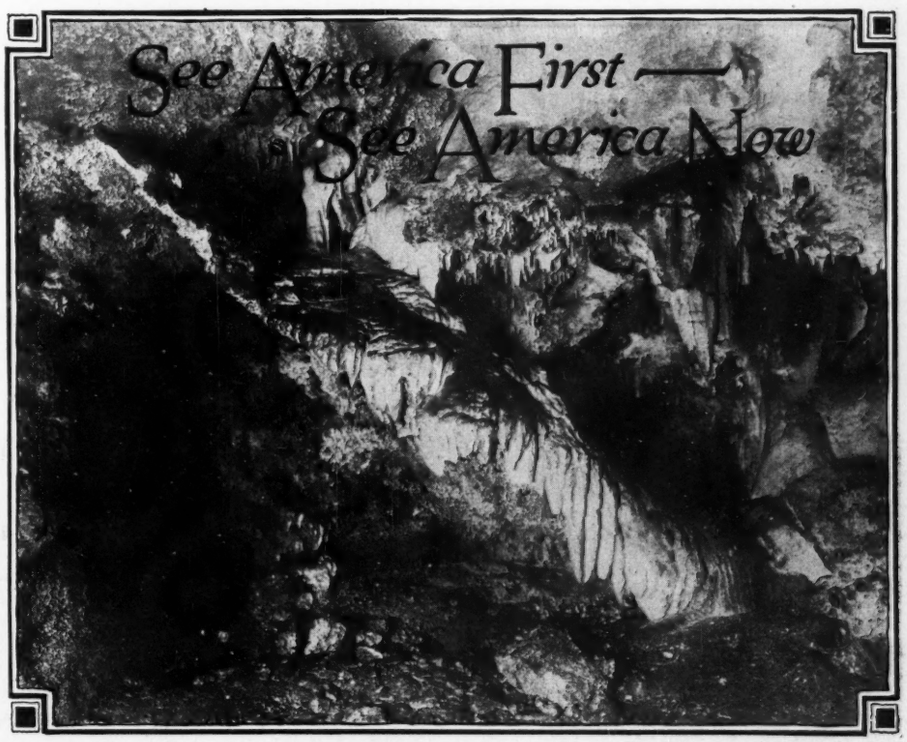
Car owners in Reading, Pa., have apparently not yet learned to distinguish between two raised fingers, which means "let's go fishing," and the signal which means north and south traffic. Michael McCullough, a motorist of this city, got confused as to the signs and was fined $6.25. One finger means east and west traffic, if accompanied by one whistle.

Help Yourself in the Shopeteria

Seattle Garage Lets Customers Use Tools in Making Own Repairs

SEATTLE, Wash., Aug. 12—The C. P. M. Garage, operated by Clark-Pearne Motors Co., has adopted a new plan for selling cars and handling used parts. It is called the shopeteria. Many customers desire to work on their own cars, or have the work done by their chauffeurs, and for this purpose require the use of an assortment of tools which are often left on running boards and frequently carried away and unintentionally lost.

The shopeteria provides an enclosure in which work of this kind may be done under lock and key by the customer. Tools are issued from the office to the customer and must be accounted for and returned when the bill is settled. If a helper is required his time is checked in and out by both the office and the customer and the same is true of a mechanic if one is used. Owners who like to tinker but haven't enough tools at home are fast taking advantage of the new scheme.



EDITOR'S NOTE—This is the ninety-first of a series of illustrations and thumb-nail sketches of the scenic and historic wonders of America to be published in Motor Age for the purpose of calling the attention of motorists to the points of interest in their own country.

NO. 91—LAVA EROSION IN WHEELER NATIONAL MONUMENT, COLO.

DOWN the southern slope of the ridge that forms the Continental Divide in Wheeler National Monument, Colorado, one finds the peculiar formations pictured above. These are thought to be the result of a succession of out-pourings of lava and showers of volcanic ash which have left a series of nearly horizontal strata of varying degrees of hardness. Many and varied are these formations and the fantastic shapes make this spot one of exceptional beauty.

Ford Discontinues Policy of Selling Cars at Retail

New Merchandising Scheme Eliminates Exclusive Territory Rights

DETROIT, Mich., Aug. 14—That the Ford Motor Co. will discontinue the selling of cars at retail is a certainty, although it probably will be some little time before the new plan of marketing the Ford car is worked out completely. Briefly, the new merchandising scheme of the big producer is similar to the methods of distributing any manufactured article, in that the actual distribution to the ultimate user will be through dealers who will have no exclusive territory rights and who will be allowed to sell the machines anywhere or everywhere. The many Ford branches throughout the country are to be nothing more than assembly stations and wholesale distribution points to these dealers. The dealers in turn will be required to maintain regular Ford service and garage methods.

Product Standardized

It is believed that the Ford car today is well-nigh a standard product, just as a lawn-mower or other implement might be regarded, and nearly everyone who knows anything about machinery or mechanical matters should be able to take care of it and do ordinary repairing. With this thought in mind, the service matter clarifies greatly, and with the wholesale branch near-by, it is no great problem to take care of any condition in connection with the car that may arise. The dealer will have the branch from which he bought his cars to fall back upon in every way, and he will also get all his parts through that branch.

In short, the new Ford selling methods are revolutionary so far as the motor car industry is concerned, but they are the principles of merchandising any standard article of commerce. Take any piece of merchandise such as any of the well-known brands of breakfast food, for example, the maker of this distributes to jobbers, who in turn supply the grocers, and any grocer can get a stock, with no restrictions as to where he sells. Suppose we consider the marketing of plows. If a certain man with a general store wants to handle a line of plows, he can secure such merchandise with no territory restrictions. The store across the street might also carry the same make of plow for his trade.

So with the sale of Fords. The Ford branch houses in all parts of the country will distribute the finished cars to the dealers, at wholesale, and one garage might handle them across the street from another. Each would retail them to his own trade. These retailers of Fords, of course, will have to be reputable dealers before they can get a supply of cars, and they will have to contract to give recognized service, but they can sell anywhere they are able to sell.

No information as to the number of cars a dealer will have to buy in order to get them through the branch at wholesale is available, but in all probability the minimum allotment will be ten cars.

It is thought that the new method greatly will reduce the garage and service cost to the ultimate user of the cars, although the plan is not yet old enough for any predictions of this kind to be made. Economies all along the line, resulting from the new scheme, might suggest ways and means of lowering the cost, but these are yet to be proven.

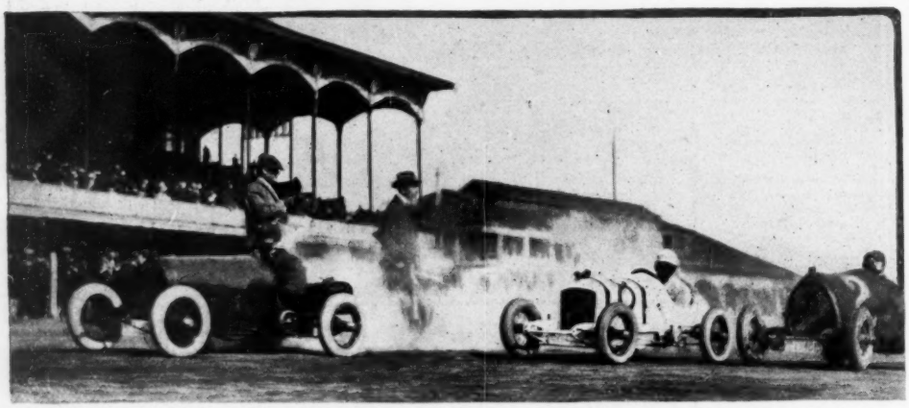
In the sense that any reputable concern will be able to get a supply of Fords at a Ford branch, any big user of cars, even though these machines be for his own business, can get them direct, providing he wants enough to come within the minimum wholesale requirements. In other words, if a big department store wanted ten or twenty-five cars for its own delivery system, it could go direct to the Ford branch and secure them at wholesale prices, without going through a dealer. If this same concern wanted less than the minimum wholesale allotment, it would have to buy them through any Ford seller and pay retail prices. It could not get this less-than-minimum number through the Ford branch.

Already in all parts of the country evidences of the new Ford selling method are to be noted. In Detroit several organizations either have been formed or are in the process of formation to sell the cars, with no territorial restrictions. They will give recognized Ford service, and maintain a Ford garage. The branch here will eventually close its doors to the retail buyer of cars. The same development will be noticed everywhere.

Ford retail Branch salesmen will not be cast adrift, many faring better than under the old plan. Reports from the leading cities advise that partnerships and agencies are being formed to retail the cars. There will be eight agencies in Cleveland and ten in St. Louis.

Chicago's Allotment 10,000

Chicago, Aug. 15.—Inquiry as to what will become of the local selling organization reveals the fact that some of the force that can command sufficient funds to purchase the required number of cars at the wholesale price will continue to sell Fords. Chicago's allotment of Fords for the year ending July 31, 1917, is 10,000, and not more than 500 cars will be allotted to any one retailer and not less than ten. About thirty different retail agents will care for the Chicago territory. Erwin Greer is one of the first to take advantage of the new plan of selling Fords.



BABY MOTOR CAR RACING

Racing of diminutive cars at the Tanforan race track, San Francisco, promises to be the sporting sensation of the season. The cars are all high-powered for their weight and capable of developing a speed as high as 70 miles per hour. They are perfect models of well-known racing cars, such as Peugeot, Fiat and Stutz. The eastern speedways will be visited by the teams this fall, according to the plans

CHALMERS OUTPUT TO GROW

Detroit, Aug. 12—There are now approximately 6,000 men on the payroll of the Chalmers Motor Co. The daily output is running from 125 to 150 cars, and within a short time a new schedule of more than 150 cars a day will be put into operation. It is expected that from 35,000 to 40,000 Chalmers will have been made by Dec. 31, 1916, which is the end of the 1916 fiscal year of the Chalmers company.

HAYNES PLANS NEW SIX

Kokomo, Ind., Aug. 12—The Haynes Automobile Co., in addition to the regular cash dividend, declared a stock dividend of 108 per cent at its annual meeting on Aug. 9 in this city. The capital stock was

increased from $1,400,000 to $4,000,000, and it was decided to proceed immediately to the erection of a new factory that will turn out the light sixes. Net earnings of $1,600,000 are reported. The company built 6,700 cars and will be able to produce 12,000 the ensuing year, 3,000 of which will be twelves and the remainder sixes. Plans were announced for a new factory for the production of a new six-cylinder model under $1,000, called the Junior six.

HUDSON PRODUCTION

Detroit, Aug. 12—Since the beginning of this month, production at the Hudson Motor Car Co. is averaging 150 cars a day. It is expected that this daily output will be gradually increased, as the company, which originally planned to build 35,000 sixes for its 1917 season, has increased its schedule 45,000 recently, and even this increase is reported to be below the number of cars which have been asked for by the Hudson distributers and dealers.

SEEKS MOTOR DATA ABROAD

Alma, Mich., Aug. 14—Cecil Hamelin Taylor, consulting engineer on the staff of the Republic Motor Truck Co., and also of the Curtiss Aeroplane Co., left last week for England and France.

Mr. Taylor will confer with aeronautical engineers of Great Britain and France and conduct an investigation into aeronautical developments among the warring nations.

ENGER COMPANY INCORPORATED

Cincinnati, O., Aug. 12—The Enger Motor Car Co. has been incorporated with a capital stock of $4,000,000 to take over the business of manufacturing the Enger car, which has been on the market for some time. The incorporators are Frank J. Enger, D. L. Jones, George W. Platt, E. E. Lincoln and Edward Ritchie.

R. P. HENDERSON JOINS PARRY

Indianapolis, Ind., Aug. 13—R. P. Henderson has severed his connection with the sales organization of the Cole Motor Car Co. to assume the management of sales and advertising for the Parry Mfg. Co. The Parry concern is taking up large-scale manufacture of passenger and commercial bodies for Fords and other small cars.

GAS AND OIL AT COST

Dallas, Tex., Aug. 12—The F. L. Shaw Automobile Co., distributor of Studebaker cars, announced today that beginning October 14 the company will furnish Studebaker owners with gasoline and oil at cost. In the announcement the company says: "Our objective is a relationship between this company and Studebaker owners that has for its end a maximum of comfort and pleasure from the use of Studebaker cars with a minimum of trouble and expense."

Gotham Tries the Traffic Court

Results of First Month's Sessions of Speeders' Tribunal Show Many Violations

NEW YORK, Aug. 14—July was the first complete month of New York's experience with its traffic court which opened June 14. A study of the accompanying tabulation will show that there has been no inclination toward leniency, Magistrate House imposing severe fines and, in default of payment, jail sentences of 10 days or over on every driver convicted. A total of $18,610 in fines was received during the month. This money goes to the fund for the wives of New York policemen.

Arraignments	1,280
Chauffeurs' licenses revoked	2
Owners' licenses suspended	2
Imprisoned for non-payment of fines	44
Total fines received	$18,610
Speeding, first offense	426
Speeding, second offense	32
Speeding, third offense	3
Improper license plates	116
Passing trolley cars, first offense	78
Passing trolley cars, second offense	1
Reckless driving	35
Failure to show badge	28
Unlicensed chauffeurs	13
Swinging number plates	2
Intoxication	5
Smoking	50
Court days	20
Cases per day, average	64

THIANNA CAR ANNOUNCED

New York, Aug. 15—Special telegram—The Thianna Motor Co., Newark, N. J., capitalized at $500,000, is about to bring out the Thianna car and will make 200 cars the first year. T. M. Peeperday, former Simplex agent in Pittsburgh, is president and John Bell, president of the Columbia National Bank, in Pittsburgh, owns the majority of the stock. The chassis sells for $3,600 while a coupe and closed body type sell for $6,000. The car has 62-inch cantilever springs and a four-cylinder motor with a bore of 3⅞ inches. The wheelbase is 125 inches.

John Dale, who recently sold his interests in the Simplex agency in this city to take over the Jordan car, has added the Thianna.

BUDA HANDLES OWN SALES

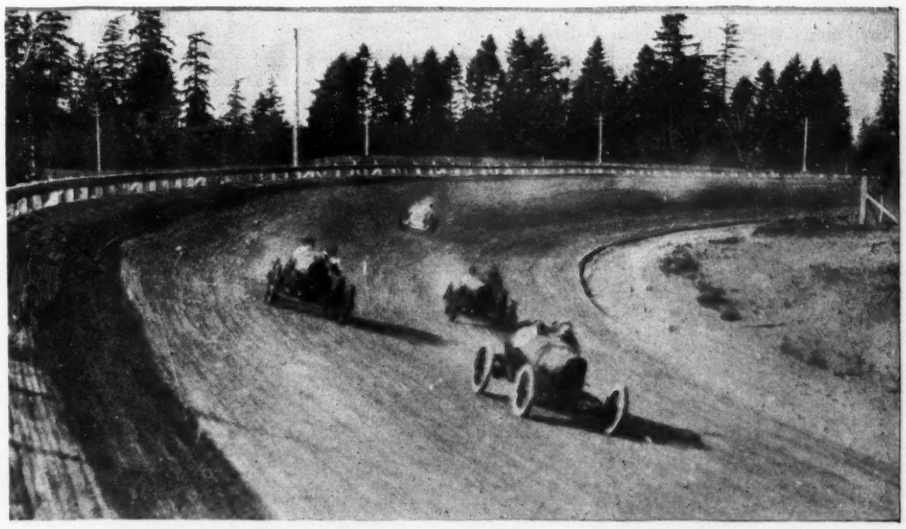
Chicago, Aug. 12—The Buda Motor is organizing a sales department and will handle the sales of the Buda motors direct, instead of through Brandenburg & Co. As head of the new motors sales department, Lon R. Smith, western representative of the Eisemann Magneto Co., with headquarters at Indianapolis, becomes sales manager on September 15 of the motor department of the Buda company, and C. V. Richardson, recently chief engineer of the Republic Motor Truck Co., has become sales engineer of the Buda company. The headquarters of the new department will be at Harvey, Ill.

REO PLANS INCREASED OUTPUT

Lansing, Mich., Aug. 12—For the fiscal year 1917, the Reo Motor Car Co. has laid out its plans for a production of at least 36,000 Reo passenger cars, which is considerably more than were made during the 1916 fiscal year. The Reo Motor Truck Co. will build at least 6,000 trucks, or more than twice the number made during the past season. There are now nearly 5,5000 men employed.

ROSS PRICE UP $200

New York, Aug. 15—Special Telegram—The Ross eight has increased the price of the seven-passenger touring car and three-passenger roadster $200 to $1,550, effective September 1.

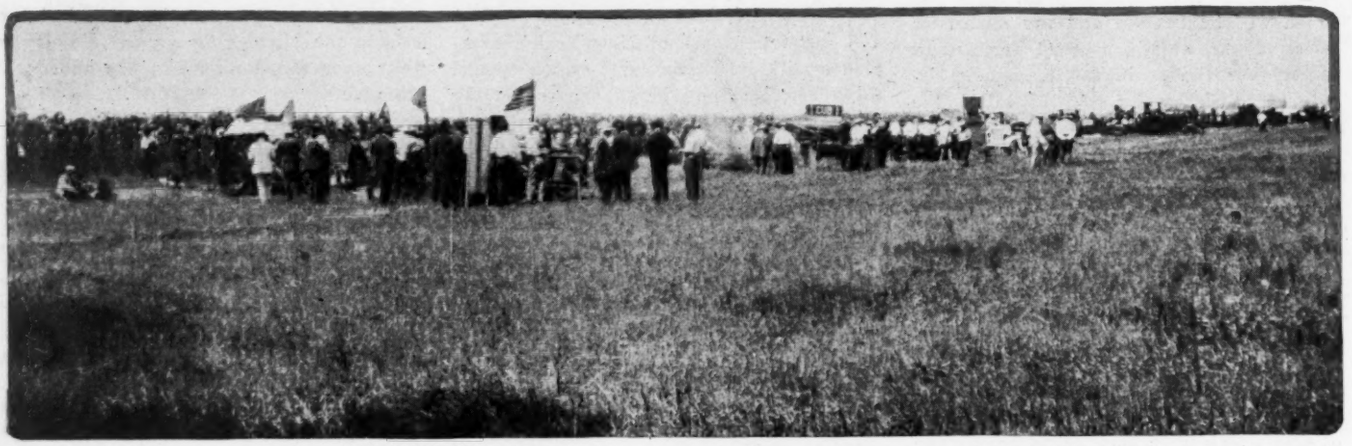


SCENE DURING TACOMA'S RACE, AUGUST 5

A lively brush between de Palma, Lewis and Milton. Rickenbacher may be seen in the rear overtaking leaders on the turn. It will be noted that a retaining wall has been added to the Tacoma speedway since last year's event

Fremont, Neb., Tractor Demonstration Sets Record

In Point of Attendance and Interest This Meet Excels Any of Other Three Held This Year



Start of the tractor plowing demonstration in a 160-acre stubblefield at Fremont. This field was plowed to a depth of 8 inches in approximately 2 hours, and 50,000 people watched the sixty-five tractors at work

By Darwin S. Hatch

FREMONT, Neb., Aug. 11.—The 4-day demonstration of agricultural tractors which closed at Fremont today has been the most successful in every way of all that have been held. It is the fourth of the series of eight national tractor demonstrations which started July 18 in Dallas, Texas, and included Hutchinson, Kan., and St. Louis, Mo. In point of attendance, interest exhibited, business done and prospects of future business obtained, the present demonstration is far and away ahead of any of the previous ones on the circuit, and ahead of the similar affairs held in Fremont in previous years.

Attendance About 90,000

Attendance for the three big days, Wednesday, Thursday and Friday, probably totaled between 80,000 and 90,000. Wednesday was the best day in the point of numbers, estimates varying from 30,000 to 60,000 for that day alone, but the tractor men were better pleased with the smaller crowds on the later days, because there were fewer who were simply sightseers. Those 40,000 people who braved the mud Thursday and the discouraging steady half-day rain Friday were attracted to the field, not as to a spectacle, but for solid business reasons. Attendance figures, however, are largely guesswork, because there are no paid admissions and there is no exact method of checking the number of visitors. An indication the International Harvester Co. gave away over 25,000 canes in one day.

In point of business done, the tractor men, with a few minor exceptions, were a unit in enthusiastically proclaiming this the most satisfactory week they have had. How many actual sales were made as a direct result of the demonstration never will be known, for the effect is not wholly immediate; besides which, some of the tractor makers do not care to give out sales figures. The International Harvester Co. by Thursday noon had sold 109 tractors, all actual sales closed at the field and all to consumers. This is almost equal to the total of this concern's sales during the entire week at Fremont a year ago. This year's high record cannot be credited wholly to this week's demonstration, for it is the cumulative effect of 3 years of tractor demonstrations.

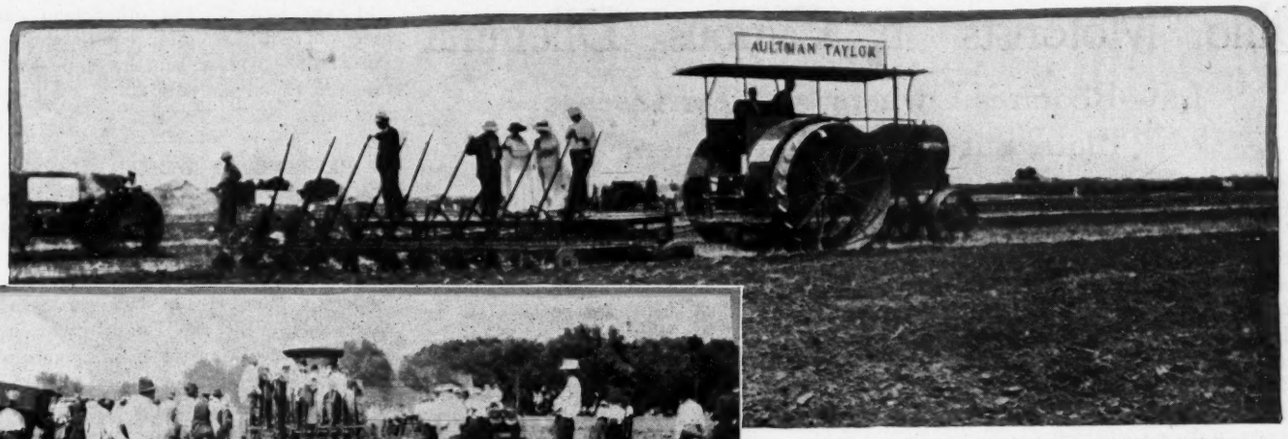
Long spikes are used on the drive wheels to give them traction on soft ground

Fremont claims the distinction of being the birthplace of organized tractor demonstrations in the United States. Canada had had plowing competitions by tractors before the first of the annual demonstrations at Fremont, but the Canadian affairs bore somewhat the same relation to the demonstrations that have been carried out through the central West, that a motor car race does to the annual motor car shows at New York and Chicago. Here, the competitive feature is eliminated as far as possible, the plowing speed even being held down by the judges to that advertised by the tractor manufacturer. Nevertheless, there is a great deal of friendly rivalry as to which tractor shall be the first to finish its alloted portion of the plowing field and at the same time, turn the deepest furrow and the straightest one.

Farmers Interested

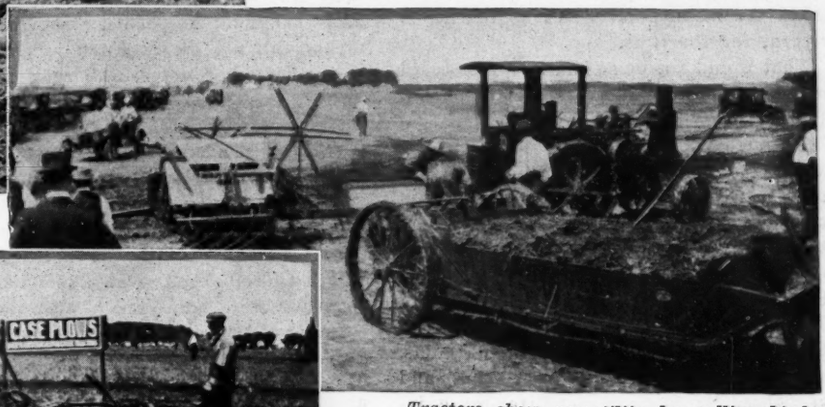
The 3 years of tractor demonstrations at Fremont has had its effect on the attitude of the farmers of that section. They do not have to be shown that the farm tractor as a piece of farm machinery is a practical and successful thing. Their neighbors have been using them, and have produced better crops on account of the deeper plowing made possible by the tractors. Three different farmers, one of whom lived 75 miles away from Fremont pointed out to me a field upon which the demonstration tractors had operated the 2 preceeding years, and which this season produced a yield nearly double that of its horse-plowed neighbors—"Deeper plowing," was their explanation.

Then, too, that territory is one which has



Farmers' wives exhibited as keen an interest in the plowing as did their husbands. In this instance the women were useful as well as ornamental, because they assisted in holding the twelve plows which were pulled by the monster tractor

Each tractor had an interested following, watching both the operation and furrow



Tractors show versatility by pulling binders, seeders and manure spreaders

A number of the smaller tractors proved that they could plow a straight furrow without assistance. This one is plowing up a 90-acre field at the rate of 2¼ miles an hour, while the driver walks behind, only taking his seat to turn at the end of the furrow. A guide wheel, which runs in the last furorw, accomplishes the automatic steering and with this type every furrow will be straight if the first one is

been assiduously cultivated by the big tractor people. Such concerns as the J. I. Case T. M. Co., the International Harvester Co., the Avery company and others with wide distribution facilities already established for their farm implements have done a great deal of educational work with their tractors, as have some of the concerns which specialize on tractors. That this has had an enormous effect, may be gained from the instance of the I. H. C. dealer in Plymouth, Neb. who brought thirty-five prospects with him and sold seven almost before the demonstrations started. It was preliminary work that did it.

Tractor manufacturers exhibited at Fremont to a greater extent than at the earlier demonstrations, both because there were more of them ready and because the Fremont demonstration has come to be recognized as the classic. There were forty different makes of tractors to be seen, and at least one-half of the makers had two or more models on display during the demonstration.

Sixty-five Machines Participate

In Thursday's plowing demonstration, which was a representative day, sixty-five machines were in the 160-acres of stubble and the field was plowed in just about 2 hours. The soil was ideal for plowing, being a black loam, just damp enough. It was a little too hard the day before for best plowing, but the night's rain put the field in best condition, though it made the mud roads bad for motor car travel. It opened one's eyes to see the unwieldy looking tractors running through the mud road at 2½ miles per hour and pulling stalled motor cars out of ditches.

According to the Hyatt dynamometer, the draft was 540 pounds with a 14-inch mould-board at a depth of 7 to 8 inches in the field Thursday. Mould-boards were almost universally used, though there were a few disks in action. Two of the Twin City tractors were fitted with deep-tillers, for sub-soiling. These are curved spikes from 12 to 24 inches long fitted to the drive wheels instead of the usual traction lugs or points. The action is similar to that of a rooster's spurs.

One of the stunts in connection with the demonstration was the continuous plowing test of the Standard Detroit 10-20, Wednesday. The tractor plowed 14½ hours until stopped by rain storms and during that time plowed approximately 14½ acres —unofficial—and finished the day's work by pulling a stuck touring car out of the mud.

As to the fuel situation, the tractor makers seem to be quite divided. Approximately one-half of the tractors in the field were operating on kerosene. To make sure that there were no false claims in this regard, the technical committee tested the fuel used in the plowing demonstrations. Nevertheless, some of the tractor men who favored gasoline impressed one with their doubts as to the real nature of the fuel used by the kerosene burners.

There was one tractor operating on

(Concluded on page 30)

Ohio Motorists in Curious Dilemma

Law Requires Owners to Wear License Plate, but Has None for Them

COLUMBUS, O., Aug. 11—Motorists in the state of Ohio, and notably the motorists who are wont to tour into Indiana and Kentucky from the Buckeye state, have been placed in a most curious position, thanks to an unprecedented incident in the motor car history of the state.

That is to say, Ohio has a few requiring every motor car to pay a license fee and to wear a license. The motorists are paying their fees and are quite eager to bear the necessary metal evidences of licenses, but somehow or other, the State takes the money, but gives no license in return, for the time.

That would not be so bad if one motored just in Ohio, where every public official understands the situation and where police and like officials are instructed not to arrest, but the minute you speed across a state-line, and especially as you tour away from the border counties, every town constable, every village marshal, every city policeman, eager to demonstrate his vigilance to his superiors, stops the Ohio motorist and, as in the war-zone of Europe, the tourist gets no farther until he shows his pass from his own home chief of police.

This is the situation now and although half the fiscal year has passed no relief is in sight. Meantime, however, the clubs at Cincinnati and elsewhere in the state have effected a plan that offers the motorist at least a partial relief.

Where the motorist applies to Columbus for his license and pays the $5 fee, he receives a receipt. He presents this receipt to his local chief of police and receives from him a police pass, stating to the officers that he is privileged to use the streets.

In Cincinnati, on his receiving this pass, the chief of police so notifies the Automobile club and it issues to him a numbered cardboard tag that serves him temporarily as would the metal license. In Cincinnati alone 1,500 such card licenses are in use.

MAXWELL HAS PROSPEROUS YEAR

Detroit, Mich., Aug. 15—Special telegram.—At a meeting of the directors of the Maxwell Motor Company, in New York today the second preferred stock of the company was placed on a 6 per cent dividend basis and on the common stock an initial dividend of 2½ per cent was decleared, virtually putting this stock on a 16 per cent basis. This dividend is payable October 2 to stock of record September 11. President Walter E. Flanders stated that Maxwell has enjoyed a most prosperous year and now has 80,000 cars of the 1917 type contracted for. Sales of Maxwells during July were about 7,000 cars and it is expected that the output will run 8,000 for August. Very likely the company will figure on a manufacturing schedule of 100,000 cars for the coming fiscal year.

RACE TO FILE LAND CLAIM

Dodge City, Kan., Aug. 4—Two motor cars were the most important factors in deciding the ownership of a quarter section of land of government property. To register on this section two farmers raced 50 miles from Garden City to Dodge City to reach the United States land office. The race began after the men discovered that they had filed on the same land in Garden City, but the first filing in the land office is what determines the final ownership and the race to get to Dodge City rehis opponent when he ran over a bottle sulted. One farmer had a 3-mile lead on and tore a tire. The other man passed him and got the claim. Both cars were Fords. The winner said he made the distance in 1 hour and 4 minutes, 2 minutes to the mile.

RESERVE OF WOMEN DRIVERS

New York City, Aug. 11—For service in case of war, a woman's motor brigade is being formed here as an adjunct to the national guard by the American Defense Society. The brigade will serve in the same manner as the English women are serving now, taking the men's places when they are called to the colors. There will be three divisions, motor vehicle owners, those who will learn to drive and others whose services will be available at all times.

SUIT AGAINST S. O.

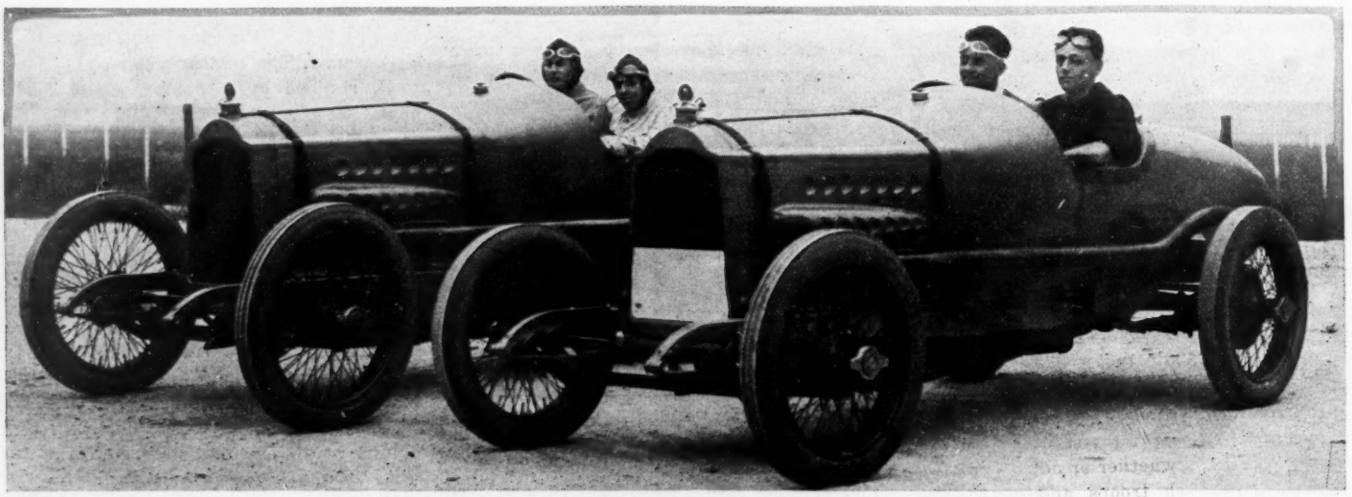
Kansas City, Mo., Aug. 14—The Universal Oil Products Co., of Chicago, filed suit in the United States district court here against the Standard Oil Co. of Indiana involving the title to a patented process for making gasoline. An injunction and an accounting are asked. The petition alleges that the process used by the Standard company in refining crude oil is an infringement of a patent owned by the Universal company.

ON TRANSCONTINENTAL RUN

San Francisco, Cal., Aug. 12—With no one in her car but herself, Miss Amanda Preuss, Sacramento, Cal., is coursing over the long trail of the Lincoln highway between San Francisco and New York in an Oldsmobile roadster on a mission of singular character.

Her purpose, rather than to exhibit her own physical prowess, is to demonstrate once and for all the genuine ease and safety of transcontinental touring, to the end of arousing the interest of American women in motor travel, and inviting them to enjoy the scenic attractions of her native state.

Her touring costume, which she designed



The two Packard racing cars at the Chicago track. These have twelve-cylinder aviation motors. W. R. McCulla and W. Rader at wheels

herself, is rather novel, consisting of khaki riding breeches, a Norfolk khaki coat, heavy tan walking shoes with puttees, and a leather cap and goggles.

The riding breeches are necessitated by the fact that Miss Preuss may have to do some tire changing in the middle of the desert, in which event the conventional skirt would not permit a sufficient freedom of movement. With her car itself she does not expect any trouble, having driven it hundreds of miles before her start without a sign of mechanical mishap. Tires are her only worry.

HIGHWAY ENGINEERING GRADUATES

New York, Aug. 14—College and university students who specialize in the highway engineering branches of civil engineering courses will find unusual opportunities henceforth of securing early employment and good pay after winning their degrees.

There has long been a decided lack of trained road engineers and the demand for them is increasing rapidly. Probably no other branch in engineering offers such sure reward at this time.

Eighteen state highway commissions out of twenty-four reporting to the National Automobile Chamber of Commerce in New York, state that there is a lack of trained road engineers, and sixteen say that preference would be given to graduates of college highway engineering courses in the appointment of additional road engineers.

Nearly 1,600 engineers are now employed by the twenty-four state commissions, and in addition, about 2,000 are employed as county and city engineers in nineteen of the states. Salaries of highway engineers range from $900 to $5,000 a year. The average is about $1,800.

BLAZING COAST TRAIL

Tacoma, Wash., Aug. 12—To blaze a trail along the shores of the Pacific Ocean from Tia Juana, Mex., to Vancouver, B. C. Wilbur Hail and Al G. Waddell, Los Angeles, and Jack Griffin, of the Maxwell touring bureau, have left the Mexican city at the terminus of the Pacific highway.

The trip is launched in order to impress members of congress with the necessity for federal action in constructing a road along the coast to be used for military purposes in times of war.

Probably the most difficult problem of the trip will be to penetrate the woods along the coast between Marshfield and Astoria, where there is no definite road except at remote intervals. Military strategists and preparedness advocates in various parts of the country are watching the results of the trip with interest. The trail-blazing party will endeavor to force a route which will be within a few miles of the Pacific Ocean at all times, the idea being to determine whether or not it would be possible to rush troops and guns to the scene of action along the coast in the event of invasion.

Garage Men Tamper with Cars?

Some in New England Town Caught in the Act —Makes Repair Work

BOSTON, Mass., Aug. 12—What appear to be attempts on the part of garage employees to tamper with cars so that the owners would have repair bills has been brought to light in a city near Boston and the owners of the cars are considering taking the matter before the highway commission. One man bought a car and had an expert go over it. There was nothing the matter with it and it ran smoothly. He hired space in a garage and the next day when he went out he found that the car was missing on a couple of cylinders. Then he got his expert friend to go over it again and they found the marks of wrenches where the car had been tampered with. He took his car away.

In another garage nearby a physician left his car one afternoon and when he took it out again the steering gear seemed to be acting queer and he bumped a pole. His son was talking about the accident with two other boys, and they remarked that while they were in the garage getting a bicycle fixed two men were working on the physician's car. As he had not ordered anything done and the car was in perfect shape he became suspicious. Talking with some of the other motor owners in the little city they compared stories and it led to the belief that employees were tinkering with cars to make repair jobs necessary. So the matter is now being discussed as to the advisability of having the highway commission make an inquiry among owners in that place to see if it is a general practice. If so the garages would be closed by the revocation of their registrations.

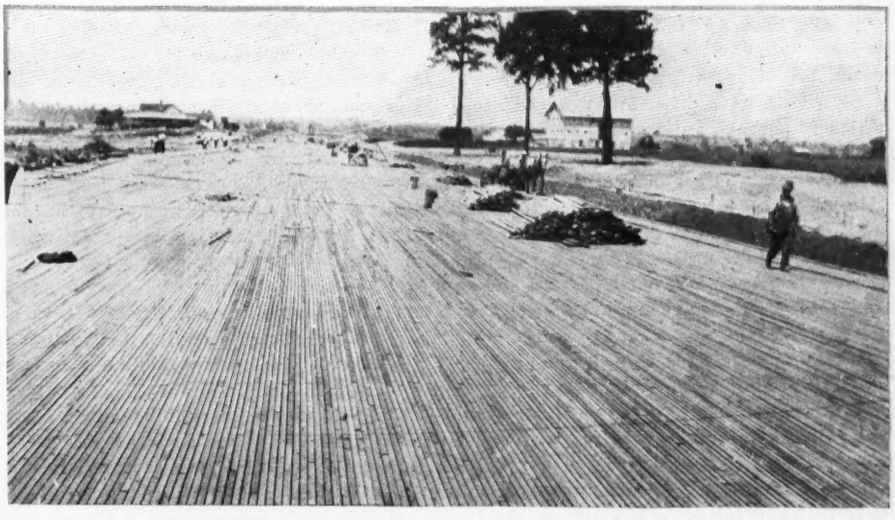
PROMOTE SOUTHERN HIGHWAYS

Birmingham, Ala., Aug. 12—Alabama is experiencing a season of high interest in big highways and active steps are being taken throughout the state to promote the construction of a number of important routes. One of the plans attracting much interest is that for a state highway with terminals at Memphis and Atlanta, and passing through Birmingham. The Alabama Good Roads Association is promoting this road, with the approval of State Highway Engineer W. S. Keller. Under a recently enacted law, any county through which a state highway passes can obtain $2,000 from the state for its construction provided it appropriates an equal amount. It is planned to use this method and also to obtain federal funds.

The Alabama-Jackson Highway Association, at a recent meeting, decided to hold a series of county meetings throughout the state and these are now taking place. This association is trying to have the memorial to "Old Hickory" routed through Alabama. Mississippi offers a contending route. The Alabama argument is that the route should follow Jackson's march to New Orleans and it is trying to reinforce this by offering a better roadway. The association will also send a scouting party through the state shortly, in an endeavor to give proof of which route is the best.

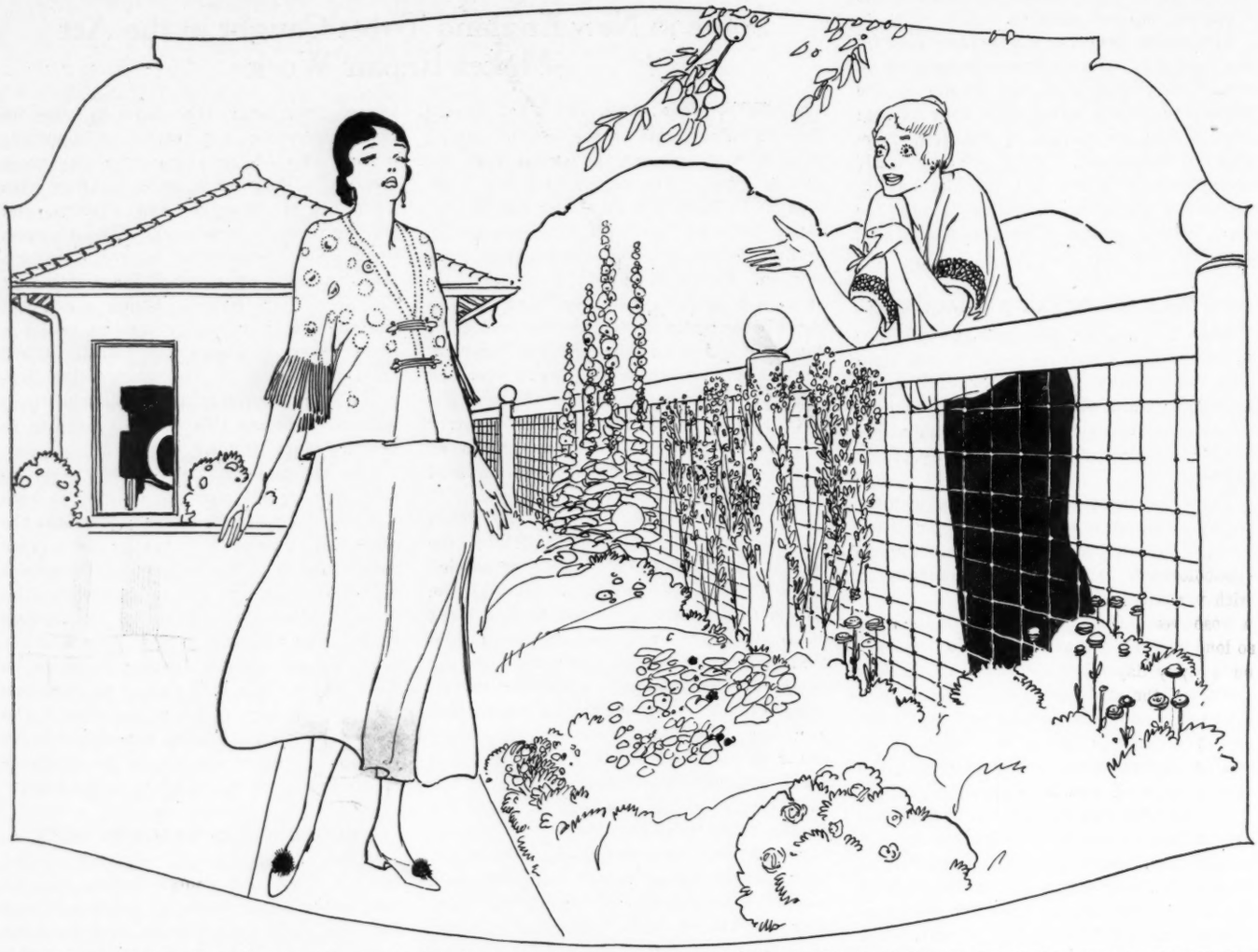
SECOND TEXAS TRACTOR MEET

Dallas, Tex., Aug. 12—Texas's second tractor show and demonstration will be held at the Texas state fair grounds during the 1916 fair, according to announcement today by J. C. Duke, superintendent of this division of the state fair. It was decided to hold this demonstration, following the success of the national demonstration conducted here in July. Indications are that this demonstration will be nearly as big as the national. At any rate more people will have an opportunity to see it than they did at the previous one.



Cincinnati's board track nears completion for the Labor day race

Between-Seasons Advice by Mrs. Wethers, Who Motors



"I have simply nothing to wear when I go out in the car," Mrs. Brandall laments. "Then, why don't you try one of these sports shops?" Mrs. Wethers demands. "There is nothink like them when it comes to finding something to fill in the chinks between seasons. Now—" and the seance as to clothes began

This Being a True Account of What Was Found in a Sports Shop

By Ruth Sanders

Eeney, meeney, miney, my;
Catch a sports fan by her eye.
If she hollers, make her pay
Fifty dollars every day.
O-U-T spells "out"—
You get out your new motoring togs now!

No, this is not a fashion story.

So, don't let a little ditty at the top, which is perhaps an earmark of Margaret Mason's U. P.-wide productions, worry you.

Rather, this is an account and explanation of what Mrs. Sol Wethers told her neighbor, Mrs. Brandall, when Mrs. Brandall was wondering how in the wide world she was going to last until the fall season and still look good enough to go out in the motor car.

"Why," Mrs. Wethers began in her most informing manner, "If you're looking for something to tide you over until the fall things are brought on, why don't you try some of these sports shops?

"Now I,"—it never took Mrs. Wethers long to leave the wire and get on the inside turn—"I went to a place down here on South Wabash avenue this morning, and I saw all sorts of between-seasons.

"Would you believe it? The most gorgeous reds, with cool blues and lavenders! Hats and shoes and coats everywhere. You know.

"One hat," Mrs. Wethers sighed reminiscently, "one hat was a kind of a silk affair with a doey stuck up on the side of the crown. I don't know exactly how to describe it, but it's adjustable. You know what I mean? A drawstring to make the crown fit your head. Works all right if your head's smaller than the hat; don't know what you would do in case of vice versa.

"There was a navy blue silk sweater coat just waiting for someone to take it. Belted back and pockets, too good looking for anything. Only $10, too.

"And if I were going to turn into a fish," Mrs. Wethers proceeded, "I wouldn't want anything better than one of those oil silk motoring coats with a hat to match. Just to look at one of them makes me literally long for dampness."

But, enough's enough. One could go on ad infinitum with the greatest abandon, adding precious iotas to the list of between-seasons, as the goodhearted Mrs. Wethers did do.

Why this between-seasons worry anyway?

Aren't the dusty roads disguising enough?

It does seem as if clothes would have become a minor consideration now that the touring season has been on so long.

However, judging from the long delay some persons had in getting the cars they ordered last spring—a delay due to the factories' inability to keep up with the demand—the 1916 season for motor debutantes is by no means over. And in such circumstances, that is, when a car owner

becomes such only when the regular season is nearly over, new motoring clothes are natural consequences.

Between-seasons for the veterans can be the beginning of a season for the novice.

Andy the novice does not wish to look the part, that is, appear in mere civilian garb; nor does the veteran wish to look the part, as far as the battle-worn aspect of the name implies at least.

For these reasons, Mrs. Wethers' visit to the sports shop should come as a welcome survey to those who really want to find something new before the fall motoring clothes are shown.

As Mrs. Wethers says, styles for women motorists have been legion this season, and the legions still are marching. The woman can pick her own favorite.

There is no use denying motor clothes have been and are fast-colors these days. A woman engulfed in a rose-colored motoring coat of oil silk, with a rose oil silk hat, and perhaps a rose veil of several lengths isn't so loud as she might appear to be, even on a rainy day.

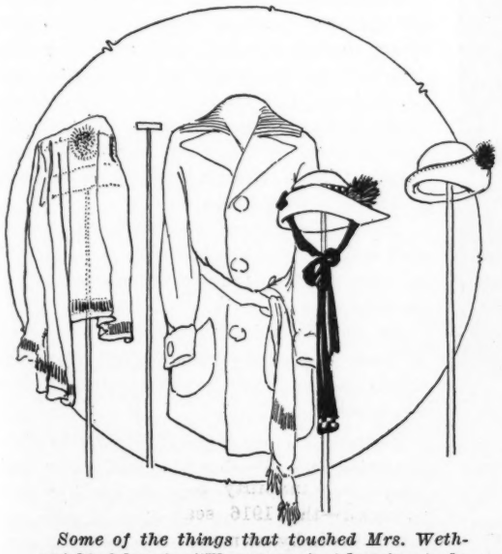
It's all the style.

The shop our friend Mrs. Wethers, visited is the Golf Shop, 33-35 South Wabash avenue, Chicago, and if you wonder at the gorgeous reds and cool blues and lavenders Mrs. Wethers said she saw there, you must continue to wonder, for color is the between-seasons' one best bet when it comes to attracting the woman motorist.

Hats abound, but this is not all the sports shops have to offer the woman motorist

Hats abound at the Golf Shop. Hats with stiff brims and hats with limp brims; hats that turn up and hats that turn down; hats of flowered covering and hats of plain covering—there are too many to tell. Most of them can be adjusted to the head by a drawstring, a novelty feature.

The hats are $5 and $6.50 hats and offer a wide variety of choice in color, style and size.



Some of the things that touched Mrs. Wethers' kind heart. "They were just begging to be taken," she said

The Batavia hat should be popular still. Coolness is its first virtue. Then, as an added attraction, it can be rolled into a wad "about as big as a fried minute," so Mrs. Wethers puts it. Packed to carry as an extra hat, it can be tucked into the oddest of odd corners without hurt.

As to coats, consider these:

The oil skin coat has both the long and the short of it in length. A hat favors each one. Several colors are offered. The coats are $16.50 and the hats $2.75.

Jersey suits have many virtues, and the greatest of these is durability. What can the late summer motoring tourist find more suitable to her purpose, especially if she is to camp any? These vary from $25 to $50.

Jersey silk coats are shown, too. Divers coats vie with each other in stripes, plaids and quiet and vivid colors. One coat combines a chrome yellow and black velvet; another is a pleasing combination of two of the most violent contrasts, red and green, with a touch of other color.

Jockey separate coats, without sleeves, you know, come in many sizes and colors.

Nor is it too early for sweaters of lamb and Angora wools for these may be worn almost any time.

Sport shirts might serve to tempt the jaded palate of between-seasons. These come in linen at $5 and in silk at $10.

The same shop which carries these things for women motorists also has a sample line of silk sport dresses, among which might be found dresses which will not crumple during a long motoring trip. They start at $15.

Now that August and vacation time is here with its temptation to flee all in the motor car—and also with its general dilapidation reigning in the wardrobe—the question of clothes is an important one. Of course, there are the advanced fall styles in motoring togs, but they are almost too advanced for those who want something right now and for the warm days that remain. The sports shop is the logical answer to the question, says Mrs. Wethers, and surely even the fastidious can find something in these things mentioned.

"And this isn't all," Mrs. Wethers said, but she could stay no longer, for just then she heard the cook say the butcher boy was there for orders.

CLEVELAND FALL SHOW FIXTURE

Cleveland, O., Aug. 14—The success attending the motor car feature of the Industrial Exposition to be held here, Sep-

tember 2 to 9, has already led to the suggestion that a fall show be held annually in this city.

The exposition managers allotted what they thought would be a liberal space for the motor vehicle section, but with the show more than 3 weeks away, this space has been entirely sold and a large addition made to this department of the exposition.

MARMON CAR WELL SEALED

New York, Aug. 11—According to reports from the Automobile Club of America, authenticity was the keynote of the Marmon company's system in checking its transcontinental car which finished in record time last week. In carrying out this object everything was done so that at the end of the run a clear case could be presented in checking the car from the Atlantic to the Pacific.

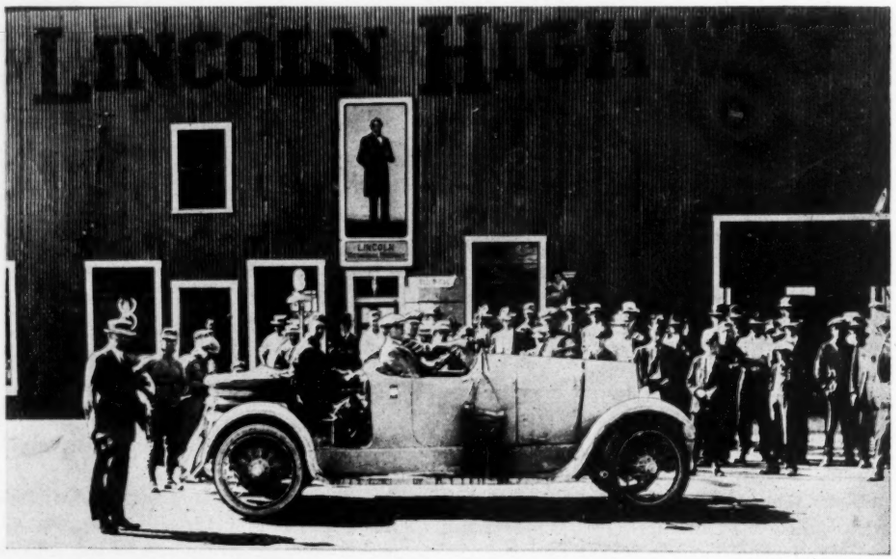
The Automobile Club of America, with its officials at both ends of the run, was the official medium under whose direction the checking work was carried out. The club sealed the car in a dozen places before the beginning of the run and at the end of the run its San Francisco representative went over the seals and checked not only the fact that this was the original car but also furnished an added witness as to the date of arrival. With this provision the record time of 5 days, 18 hours and 30 minutes can well stand as official.

Out of twelve seals put on the car at the beginning of its run, eight were intact. Of the remaining four, three were gone and the other broken and hanging on the car. Those seals that were missing were placed on the transmission case to the torque tube; on the bolt through the differential case; and on the left front spring. The seal on the torque tube to the differential housing was broken but hanging to the car.

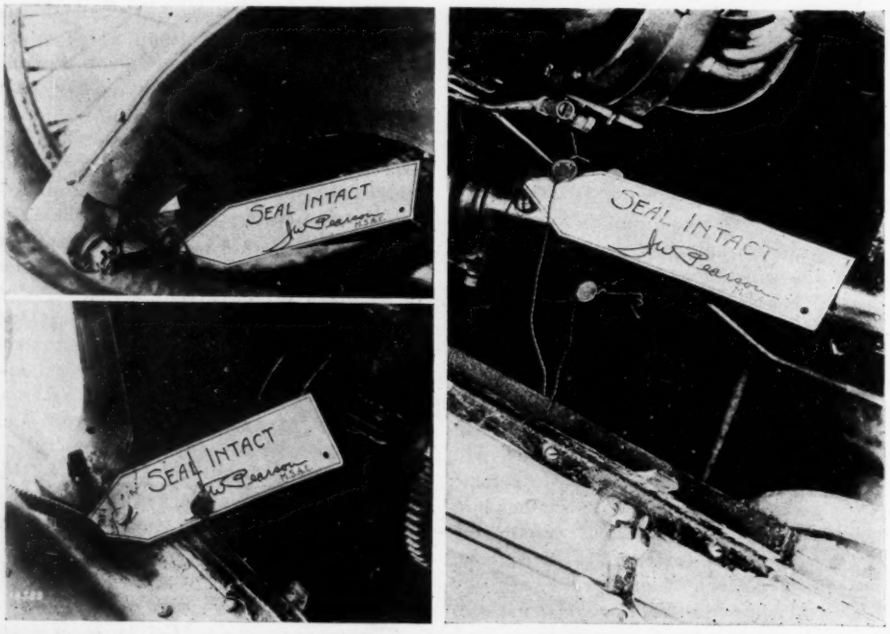
After thoroughly investigating the original seals on the car, certain identification marks on the car were gone over. It was found that the original six wheels were gone. The rest of the parts were found intact with the exception of the socket on the torque tube end which had been moved or repaired.

Among those who observed and checked the Marmon transcontinental car were Arthur Metzler, of the Buffalo Times; Walter A. Kiedaisch; H. H. Flook, of the Des Moines Capitol; Jones H. Clark, Jr., of the Omaha World-Herald; D. O. Hodges, North Platte, Neb., and Stuart Gayness, of the San Francisco Examiner.

Among those who reported progress of the car were the Western Auto Transit Co., Rook Springs, Wyo.; A. E. Hubbard, Evanston, Wyo.; W. R. Reynolds, Eureka, Nev., and Western Union operators at Fallon and Austin, Nev.



Marmon transcontinental car at Ely, Nev.



Seals on various parts of the transcontinental Marmon 34, placed before the start in New York by Automobile Club of America officials, examined and found to be intact upon arrival in San Francisco

CHANGES IN FUEL PRICE

Chicago, Aug. 15.—Though the price of gasoline in this territory remains at the same figure it has held for several weeks reports from other parts of the country show a drop in the East and South and a rise in the West. The reports follow:

Boston, Mass., Aug. 12—Gasoline began to make a slide downward in New England the last week. On Monday the word was passed around that the price had been dropped 1 cent from 25 to 24 cents wholesale. On Wednesday another drop of 1 cent was announced to the dealers. There was no public announcement in the papers. Some of the dealers are wondering about the retail price which varies from the wholesale to 2, 3 or more cents above the oil company's price.

Louisville, Ky., Aug. 12—The price of gasoline has dropped 2 cents in this territory during the last few days. For several months the fuel has been retailing at 23 cents, but since Thursday motorists have been paying 21 cents. The Louisville branch of the Ford motor Co. continues to sell gasoline at 20½ cents a gallon to Ford owners only.

Dallas, Tex., Aug. 12—Gas in Dallas is still selling for 19 cents with prospects of no decrease. Although reductions of 10 cents per barrel have been made in Oklahoma and Louisiana crude oils the price of gasoline and kerosene is not expected to go much lower in this part of the Southwest.

Portland, Ore., Aug. 12—Instead of a reduction in the price of gasoline, as had been expected during August, another cent has been added and gasoline is now retailing throughout the city at 21½cents per gallon.

Tractor Men Discuss Affiliation with S. A. E.

Five Engineering Bodies May Merge and Become Known as Society of Automotive Engineers

FREMONT, Neb., Aug. 10—Further steps toward the formation of the Society of Automotive Engineers were taken last night at a combined meeting of the Society of Tractor Engineers, and the Society of Automobile Engineers at the Fremont Commercial Club, in connection with the annual tractor demonstration. The movement toward the affiliation of five engineering bodies identified with the self-propelled vehicle industries which has been proposed by the Society of Automobile Engineers, already has resulted in plans for concerted action by the aeronautic engineering society and the motor car engineering society, and there are strong indications that the engineering societies of the tractor, motor boat, and stationary internal combustion engineers will co-operate in a general institution which will have the name of the Society of Automotive Engineers.

At last night's meeting, H. L. Horning, of the Waukesha Motor Co., presented the subject to the tractor engineers, of being a member of the S. A. E., and the S. T. E. He brought out the point that it was not the idea of the S. A. E. to absorb the other associations, but that the Society of Automotive Engineers would be the hand of which the different organizations would be the fingers and thumbs. All the organizations would come in on a mutual basis.

Government Would Welcome Affiliation

The United States government, Horning said, had expressed a wish that these organizations, to a certain extent, be under one head, in order to make its negotiations and recommendations for the standardization of the allied lines more feasible, and the object of the meeting last night is to determine what arrangements can be made.

George W. Dunham, president-elect of the S. A. E., spoke on the advantages of the affiliation and the plan was outlined by Coker F. Clarkson, general manager of the S. A. E. So far as the management of the combined societies is concerned, this would be in the hands of a council constituted similarly to that of the S. A. E., except that there would be an addition of four vice-presidents, one from each of the affiliating bodies. Each of the societies would retain its identity to a certain extent, having its own meetings, and being chiefly in control of the standardization of elements which entered chiefly into its own industry. In the general meetings of the Society of Automotive Engineers, which would correspond to the semi-annuals of the S. A. E., the individual societies would have as much part in the presentation of papers and in the discussion as they had material to offer.

George Strite, president of the Society of Tractor Engineers, expressed a general opinion of the tractor men at present when he said, all agreed that on getting results all of the tractor men have realized the work of the S. A. E. He instanced the face value of the S. A. E. tread standard, stating that tractor men would find it better than the U. S. tread, and that the S. A. E. has a complete organization for the standardization of parts. He voiced the chief objections of the tractor men when he said that the latter seemed not to understand the reason for the S. A. E. urging the combination, the tractor men asking "does the S. A. E. want to steal our stuff?"

It was decided by the tractor men to take definite action at the general meeting of the S. T. A. at Minneapolis.

ESCANABA PROHIBITS TRAILERS

Milwaukee, Wis., Aug. 12—The city council of Escanaba, Mich., has passed an ordinance prohibiting the use of trailers on motor trucks. The same law fixes the maximum speed of motor trucks at 8 miles an hour and the maximum load of any vehicle at 8,000 pounds. The ordinance says:

"It shall be unlawful for any person, persons, co-partnership, firm or corporation to run or drive, or cause to be run or driven, upon the public streets of the city of Escanaba, any motor truck which has a trailer truck or trailer wagon connected or attached to said truck. Motor trucks shall be driven at a rate of speed upon the public streets of the city of Escanaba not to exceed 8 miles an hour. It shall be unlawful to run or drive any vehicle or motor truck carrying a load exceeding 8,000 pounds, unless the load shall consist of an article which cannot be divided." The penalty for violation is a fine of not more than $25, or imprisonment not to exceed 30 days, or both.

LOUISVILLE AFTER SHORT-WEIGHTERS

Louisville, Ky., Aug. 12—Charged with vending gasoline with defective or imperfect measures, summonses against the Roy E. Warner Co., the Quick Tire Service Co., and the Krebs Drug Co., to appear in Ordinance Court were secured recently by John W. Headley, city inspector of weights and measures. The summonses came as a result of a campaign against dealers of gasoline alleged to have been giving short measure of the fuel to their customers. Many complaints have been received at the inspector's office, who as a result of his inspection has condemned many of the gasoline pumps.

Mr. Headley, in a general statement concerning the campaign which he has inaugurated and will continue until he has eradicated the practice by dealers, said: "In obedience to general complaints that vendors of gasoline were giving short measure, my deputy was sent to make inspection of the pumps. I have only summoned three offenders into court, though a large number of pumps were defective."

The short measure runs as high as one-half gallon to five gallons, according to records of the inspector's office. The pumps were "set off" in some instances. In others from a quart to a quart and one-half was held in the hose, because it was not drained for the customer, according to the inspector.

FORD CARS' INSURABILITY

Chicago, Aug. 14—The decision of the Ford Motor Co. to change the style of its cars and reduce its price at the same time has created an upheaval in insurance circles. So long as all Ford cars were of the same style the loss because of depreciation was not so great, now that a new streamline model is to be introduced it is feared that every old Ford car will at once be regarded as a back number and less desirable and this will introduce a material moral hazard. Some underwriters estimate that the insurable value of the old style Ford cars has been depreciated 50 per cent by the announcement of the change.

PROTEST DISTRESS WARRANT RULING

Nashville, Tenn., Aug. 11—An injunction against the issuance of distress warrants, involving additional costs, for motorists who fail to pay their road oil tax, was granted by the chancery court, following the filing of a petition by a number of car owners, who ask that the law authorizing the tax be declared unconstitutional. The question of constitutionality, itself, is to be decided at a hearing set for the October term.

The granting of the injunction is received with mixed feeling by local motorists. The Automobile Club had nothing to do with the suit and many motorists felt that the money was well-spent in providing dustless and durable roads. Those filing the suit say that they do not object to paying the tax, but that it is unfair in that it applies only to machines used for pleasure, thus exempting motor trucks, traction engines and other vehicles which, they claim, do more damage than the passenger cars. They declare that what they want is to have the law amended at the next session of the legislature. The tax is collected in addition to the state license tax. Recently Nashville motorists secured the repeal of a city tax of $1.

Argentine Ready for Motor Trucks

One of the many new wide streets in Buenos Aires. They are forming a network into every part of the city and making it ideal for motor trucks

Intelligent Selling and Good Business Methods Can Develop Prospects in Buenos Aires and Camp

By David Beecroft

Editor's Note—This is the fourth of a series of articles on South America by David Beecroft, managing editor of Motor Age, who has just completed a lengthy trip through the Argentine, Uruguay and southern Brazil. In the preceding article, published in Motor Age issue of August 10, the author told of the perfect road of Argentine and the lack of a highway system.

BUENOS AIRES, July 1—Argentine is a poor motor truck country, perhaps the poorest in all South America; yet it should be the best. The truck has never got started right in Buenos Aires, whereas Rio de Janeiro and such other Brazilian cities as Santos and Sao Paulo took up the European truck in earnest.

Buenos Aires is not without motor trucks, but it has too few. On June 30, 1916, there were only 330 motor trucks registered by the traffic department of the city. At that date there were more than 35,000 horse trucks registered, more than 4,000 motor taxis, 3,000 horse taxis, 4,000 private motor cars and more than 2,000 private horse vehicles. Motor trucks are conspicuous by their absence. Today 97 per cent of all hauling is done by horse vehicles. There are more than 100 times as many horse vehicles as motor trucks. Yet Buenos Aires, which can be taken as a good criterion of the motor truck field in Argentine, is making headway, and it may be that the truck business will have the same unexpected development that the motor car is enjoying there today.

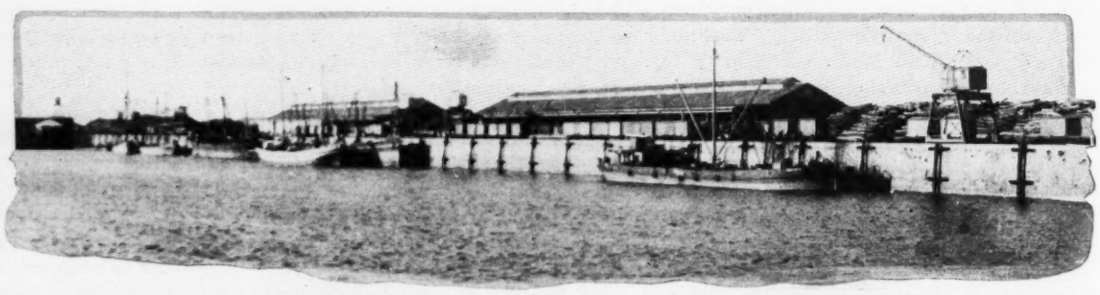
Business men have not yet been sold to motor trucks. They speak of motor power with misgivings. They do not know what trucks will do. Many of the 330 are looked upon as a compromise between experimentation and advertisment. Dealers do not seem to be sold to the motor truck. They shake their heads and say the hour of the truck has not yet arrived. They are faint-hearted Thomases. They got such a solar-plexus blow when the financial crisis hit them a few years ago that they are still suffering. But they have been aroused to the possibilities of the motor car trade, and we believe they will be similarly aroused within the next few years to the possibilities of motor trucks.

Buenos Aires is going to be a great motor truck city, the greatest in South America. Today Rio has more than twice as many trucks as Bueons Aires, yet Rio is not half as large and not half as well fitted for truck use. You will have difficulty finding a city better adapted for trucks than Buenos Aires, in spite of the fact that the older part of the city has narrow streets.

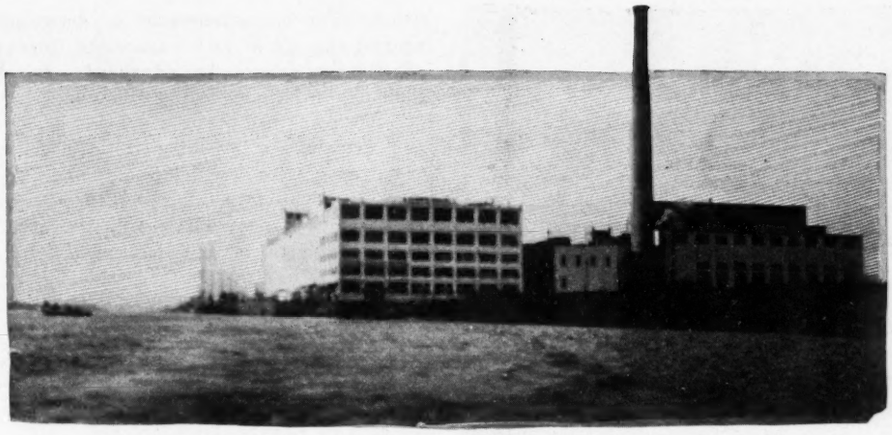
Today traffic conditions are worse in parts of Buenos Aires than they are in New York at Fifth avenue and Forty-second street, or in Chicago at State and Madison. But Buenos Aires has a good traffic system, largely fashioned after New York and London, and the traffic department could hardly be improved upon. The policemen are on the job night and day and handle traffic positively and speedily.

Buenos Aires is ideal for trucks because it is essentially a city of great distances; its distances being 50 to 100 per cent greater than in Chicago in ratio to population. This is due to the absence of apartment buildings and to the fact that the Argentine middle classes generally live in one-story homes and have gardens. Spread Chicago out on a one-story basis, and see how much more of Cook county will be covered. Bring New York under a one-story regime, and you will spread it over a portion of Long Island or New Jersey. Buenos Aires is spread out.

But with great distances you have level streets. Buenos Aires, growing along the shore of the Rio de la Plata River, is on land scarcely 3 feet higher than the river. The entire city is level. There is not a



Docks at the port of Santa Fe, which is up the river from Buenos Aires. Note the grain warehouse and piles of logs used in tanning. This is a very modern dock



Armour & Co. slaughter house. This is the most modern in the world. It is at La Plata, 65 miles from Buenos Aires

hill on which to demonstrate a car, and you go several hundred miles into the country before you meet anything that suggests a hill. It is ideal motor truck ground.

Many Well-Paved Streets

Further: The city has well-paved streets. All South American cities have. Buenos Aires has many asphalt streets, but all the business streets are of square stone blocks. These blocks have been imported from Europe as steamship ballast, or have been brought by boat from Uruguay. The stones are as well shaped as bricks and wonderfully smooth to ride upon. Those familiar with the stone pavement on Lafayette street, New York, a wide thoroughfare leading from the center of the city down to the entrance of Brooklyn bridge, can form some idea of how good these block pavements are. Buenos Aires has had to go into street construction scientifically. Lack of materials has proved a good tutor. Where street materials abound, it is generally a case of the shoemaker's children going without shoes. Where materials have to be brought 6,500 miles, it means careful and scientific study.

In all Spanish cities the streets run religiously east and west, cutting those north and south at right angles. Cities are literal checkerboards. Generally, streets in Spanish cities are narrow. In hot climates a narrow street is very cool. The sun never gets into the narrow street as it does into a wide thoroughfare. Keeping the street narrow is a parallel with the housewife keeping the windows closed and blinds closely drawn in hot weather. Experience has been a wise tutor in both instances.

These narrow streets have held back trucks, but there is no reason why they should. One-way traffic is the rule, and you make as good speed as on the wide streets of a city like Minneapolis, or Kansas City. The speed you make in any city is dependent on your traffic control and not on the width of streets or the number of vehicles.

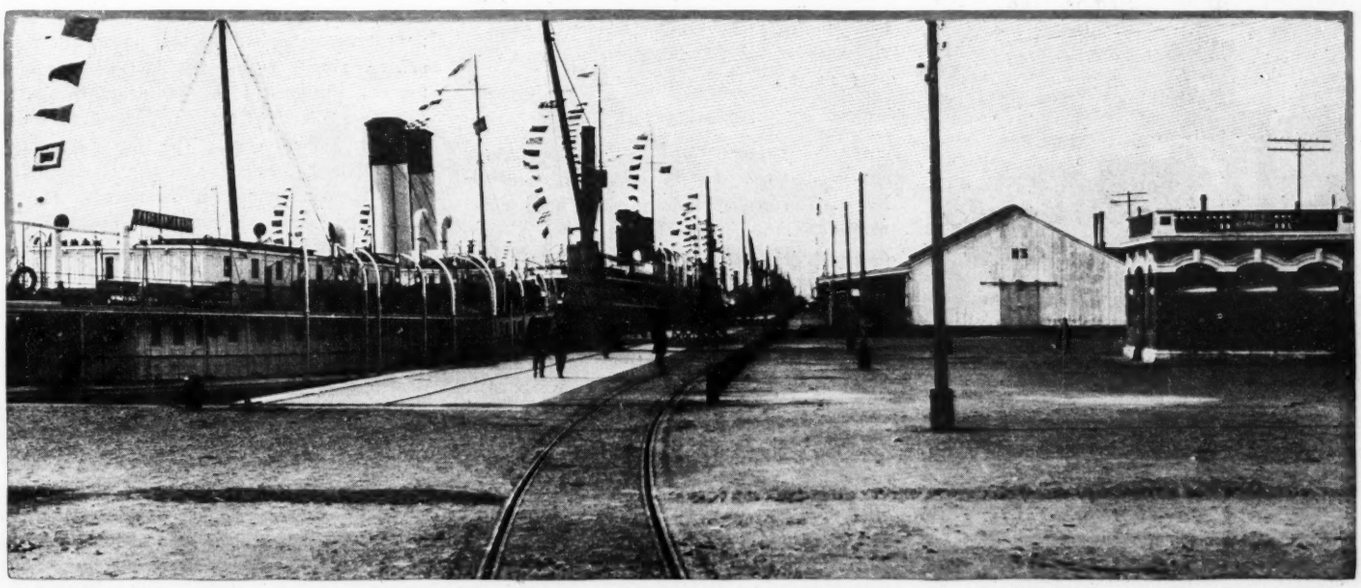
But Buenos Aires has more wide streets that have been specially built for traffic than have many of our U. S. A. cities. Every fourth block has a business street as wide as State street, Chicago, and often wider. These are well paved and you cannot ask for anything better for motor trucks. They are as ideal as Cottage Grove avenue, which leads south from the heart of Chicago and connects with the outlying suburbs.

The city is starting to buy trucks. One day in June, D. B. Richardson, manager of the Studebaker business in South America, announced that he had sold thirty motor delivery wagons to Gauth & Chavez, one of the large department stores. For several months the store had been experimenting with six Studebakers and when the deal was sealed it was due solely to the excellent performance of the vehicles and the economy of motor delivery as compared with horse delivery. This big store is located in that part of the city where there are narrow streets, and its delivery service covers all the narrow streets. Facts showed the superiority of motor delivery.

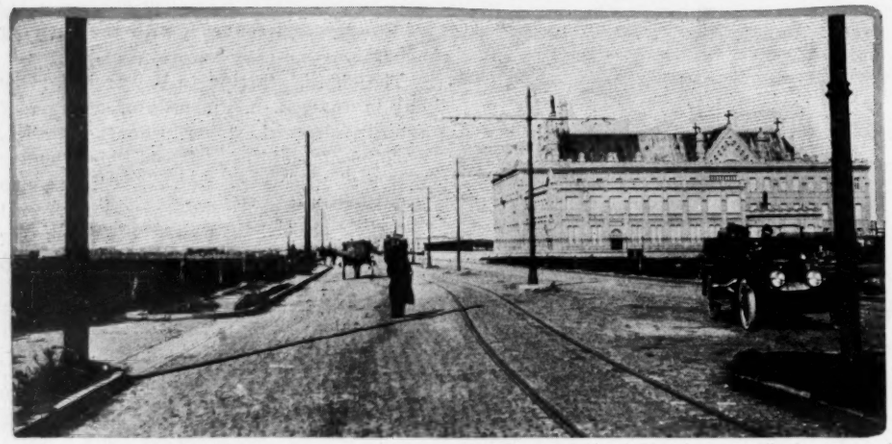
The head of the delivery department of Gauth & Chavez is an Italian with a reputation for being as keen a business man as you can find. He is chairman of the board of directors and a man of influence. He had to overcome the prejudices of many of his directors, who objected to purchasing U. S. A. trucks when the money back of the firm came from England. It was a case of business sense overruling patriotism.

Armour Uses Trucks

H. E. Finney, manager of Armour & Co., which has the most modern slaughter house in the world at La Plata, 65 miles from Buenos Aires, is an old Chicago man. He got his Armour experience there and in other parts of the Central West. He is proving one of the best advertisements of motor delivery work in Buenos Aires. Armour & Co. sells a large quantity of slaughtered beef and mutton to the retail butchers. Two Studebakers have been used for a few months, and figures show a saving of more than 40 per cent over the previous horse system. The motors have shown a large increase in business. No doubt before this date Armour & Co. have added more cars.



This is a typical dock scene in Buenos Aires and shows the very wide, well paved streets leading to it. The city is ultra modern in this respect. It is ideal for motor trucks



A very wide Buenos Aires street leading toward Quilmies, where the largest brewery of the city is located. There are several other streets in this section just as wide

Other examples could be cited to show that motor trucks and motor delivery wagons can be used, and used satisfactorily. The day is passing when it can be said that this Queen City of the Southern Hemisphere is not a good motor truck city. It only awaits the intelligent selling of trucks, such as our country has had.

Of the 330 motor trucks and delivery wagons used many are in varied services. One of the largest breweries, Quilmies, which has an international reputation of being among the largest and one of the best managed of its kind, uses six motor trucks and has 100 two-horse wagons. The trucks are 4- and 6-ton Mercedes, and when U. S. A. trucks were suggested the remark came, "The American truck is absolutely no good." This is a whole chapter on our reputation in Argentine, and the sooner we get there and do the Missouri act the better for our export trade. The Quilmies organization believes that the motor truck helps business by way of advertisement and gives a better delivery system to customers, but that the cost is higher. The manager finally agreed that all the system would be changed eventually to motor traction.

Buenos Aires docks abound with European traveling cranes used to load boats from cars and trucks and vice versa. This traveling crane spans a double railroad, one track wide gauge and the other narrow gauge

The Buenos Aires postoffice is a strong believer in motor traction and is going to continue installing trucks as finances warrant. Today the postoffice has forty-five motor vehicles and ninety-seven horse vehicles. The motors have capacities of from 400 to 6,600 pounds. Several are used for regular mail collection from street corner boxes, affording proof of motor economy even in the congested parts and on the narrow streets with their one-way traffic regulations.

On such streets as this wide one is typical of, you can reach every part of the city by motor car or motor truck

Voiced Arguments Against Trucks

Many reasons have been advanced against motor trucks and deliveries in Buenos Aires, but none of them hold water when analyzed, and Buenos Aires is just like any other great city of 1,500,000, namely, an ideal place for trucks. It has been urged that in the city are many large teaming concerns that really control freight movement and are opposed to trucks.

This is not the case any more than in St. Louis or Boston. It has been argued that the streets are too narrow. Two or three examples we have cited prove otherwise. If more examples are needed they are at hand. It has been further argued that wholesale houses are on narrow streets and that horse vehicles have to wait in line for hours to get their loads. This applies equally well to Milwaukee or Provisent our own men there, and they will hold back the sale of delivery wagons and trucks until we go there and show them how to use trucks. The market is there, but the selling spirit is lacking.

In order to get a definite, yet very conservative, estimate of the possibilities of selling motor trucks in Buenos Aires, I made a canvass of the business firms with Manager Titus, of the National City Bank of New York, there. This bank has only been open 2 years, but in that time it has risen to sixth place in deposits in a field of twenty older institutions. To facilitate U. S. A. firms doing business there the bank has a very extensive credit and commercial department and is the best source of information in that country.

Our ultra-conservative canvass of the firms, having regard for the volume of business, as well as financial standing, showed 800 firms that should use motor transportation. Some of these are very large concerns and others would be in the market for perhaps one or two small-capacity delivery vehicles. This estimate would be doubled if we were to add those firms whose financial capital warrants their buying trucks. We could add very materially

Truck trade in Buenos Aires has suffered from paralysis of selling ambition. Some of our companies have gone there and have come back without trying to make a sale. They were frightened by the high price of gasoline and the shortage of money. In some places are U. S. A. trucks in storehouses. They have been there for 2 or 3 years and may remain there much longer, because they are in the wrong hands. They are in the hands of dealers who have not even yet seen the possibility of selling motor cars in Buenos Aires, let alone motor trucks. It is such dealers who held back the sale of U. S. A. motor cars until we

A wide Buenos Aires street that will be adequate for traffic when the city has a population of 3,000,000 *or* 5,000,000

to it by including those firms who, solely on volume of business, should have motor delivery systems.

Many Firms Could Use Trucks

These 800 firms are made up of the usual array of business houses to be found in any city with a population ranging from 1,500,000 to 1,800,000. For example, in the suburb of Quilmies, 20 miles out of this city, is the celebrated Quilmies brewery, which has been mentioned already. It is just that distance from the city that motor trucks could be used to advantage for direct delivery from the brewery to the retailer. In addition there are two other large breweries, but they are not in the same classification as Quilmies as regards size or management.

There are five or six furniture concerns that have large retail houses and large factories. They have the question of delivery from the factories to the retail houses and thence to the consumers.

In Buenos Aires are seven or eight large wholesale grocers and perhaps thirty others of smaller caliber. The city, with its huge area, is peculiarly adapted to the motor truck in this service. The grocer requires daily deliveries from the wholesaler.

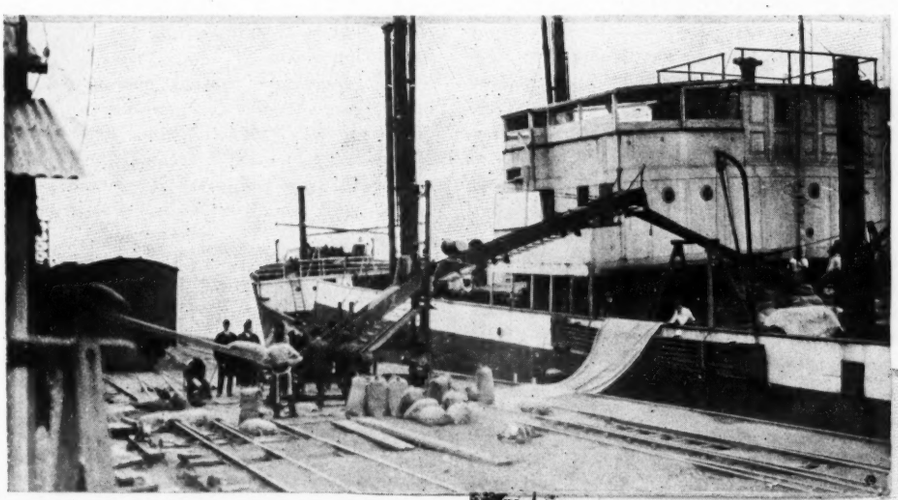
You can find ten large concerns in the textile trade and more than forty smaller ones. These are largely wholesalers with not only large deliveries to city retailers, but much transportation from depots to warehouses and again to depots for country distribution.

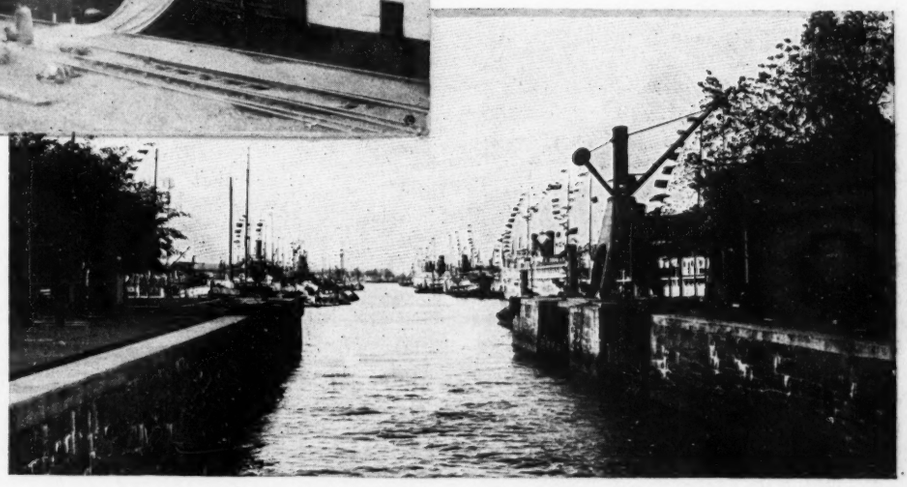
Shoe Factories Active

Shoe manufacturing is a growing industry, and already there are four or five factories that manufacture 1,000 to 1,500 pairs a day. All are either delivered directly to the retailer or to the railroad depots.

There are two very large tobacco concerns that are as heavy advertisers as any in the U. S. A. Both of these have started in with motor trucks and lighter delivery vehicles and will be in the market for more. Today they see trucks as good advertisements; tomorrow, as investments and necessities.

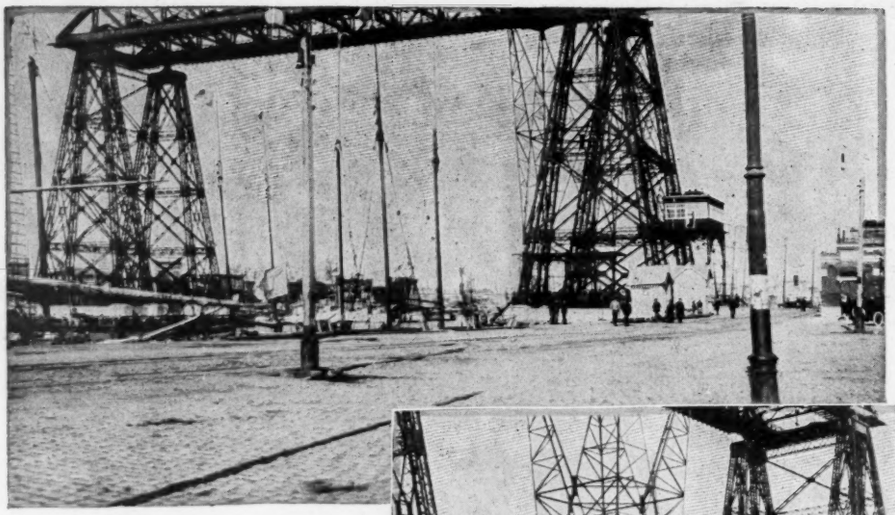
In our canvass we counted five large firms in the wholesale hardware business and twenty smaller ones who are prospects for motor transportation of one kind or another. You can count on six large wholesale drug houses. Add to this list





Above—Loading 132-*pound bags of grain by automatic conveyors. You see such devices all through Argentine. They can give the U. S. A. lessons in loading*

Right—Glimpse of one small section in the wonderful Buenos Aires docks. They are the most modern in the world and have wide areas that make it ideal for motor truck use, as there is no congestion



A remarkably short time is needed to travel from one side of the bridge to the other. There is very little traffic delay

seven or eight firms in the lumber trade and five large concerns who specialize in building construction materials.

There are five large daily newspapers, two of which rank with the finest daily papers in the world and will compare in size, makeup and general news value with our own New York Times or Chicago Tribune or Kansas City Star. One of the smaller is already using some Studebaker vehicles.

Buenos Aires, as well as other South American cities, has a large field for medium-capacity vehicles in the caterer trade. Here they are called confiterias. They want 800-pound vehicles for quick delivery of pastry, etc. There are from fifteen to twenty who should use such vehicles and many others that are in the market. Several inquiries were made for a light type vehicle for this trade.

Paper Companies Prospective Buyers

Six large concerns in the wholesale paper trade receive their stocks from the U. S. A. or Europe and deliver it to the consumers as well as re-ship much to interior cities.

Buenos Aires has eight good department stores, one of which, we stated, has added thirty Studebakers to its delivery equipment. This is only a starter. Harrods, a branch of London's big store, uses motor delivery largely. Practically all the department stores will change from horse to motor system just as they are doing in our U. S. A. cities.

To this list add seven large candy manufacturing concerns, twenty printing houses, match factories, fruit jobbers, five or six large clothing makers, two tanneries and scores of other industries.

One of the largest fields for motor trucks in Buenos Aires is the local meat slaughtering trade for the city. A large percentage of the meat is slaughtered at the mataderos or slaughter houses, which are on the outskirts of the city.

According to the city ordinances the meat slaughtered in the morning at the mataderos must be delivered to the retail butchers in the city by 11 a. m. At present 220 to 250 wagons are used in this service. They are generally two-horse, four-wheel types of 4-ton capacity. These carts are owned by different concerns, but a large cartage organization exercises a control over them. The thought is that all these can be displaced by motors. Complaints are rife regarding the lack of proper sanitation in the horse vehicles, particularly in the hot summer months of December, January and February. There is talk now of erecting new slaughtering houses which would be the last word in sanitation, and if such were installed the motor vehicle would be certain to supersede the horse. Even if the new mataderos are not built for a few years, there is going to be a change in the delivery system and a few motor vehicles are sure to come into use. An apparent handicap is that deliveries start at 5 a. m. and close at 11 a. m..

Armour is contemplating the installation of a motor bus line from La Plata to Buenos Aires to handle all the sales to butchers. At present the meat has to be sent by train, and it will prove much cheaper to handle it by motor truck over the new stone road mentioned in last week's article.

There are several large privately-owned slaughter houses in the outskirts of the city and the Armour and Swift slaughter houses at La Plata are 65 miles out. The former use horse carts.

Heretofore it has not been possible to ship any by motor truck from La Plata as there was no road, but within the last month, this road has been practically completed, except at the La Plata end, and once it is done it will be the finest road in South America for motor truck use.

Armour is now using two Studebaker delivery wagons in retail work and is saving more than 40 per cent over its previous horse delivery system. An economy of $1,000 in May as compared with April was accomplished.

The camp, or country, as an opportunity for the sale of 2 or 3-ton trucks, is a field in itself nearly as large as Buenos Aires, and perhaps much larger. The big farmer, or estanciero, with his 300,000 acres of land or more, will be using trucks within 5 years. He needs them today to take the place of his 8 or 10-ton carts, drawn by 25 or 35 horses in bad weather.

One estanciero, who purchased a Jeffery quad a year ago, admitted that it had already paid for itself several times. He uses it in all departments of farm work. It hauls the grain to market, distributes seed grain to the smaller colonist farmers, to whom the estancio rents parts of his huge areas, and does everything that is required of it.

Trucks on Farm

This is, perhaps, the first case where one of our large trucks has gone on the farm, but it suggests unlimited sales possibilities. The country is ideal for the truck as well as for the car, and with its sparse population and immigration very seriously handicapped by the war, trucks or cars will aid farm machinery in making up for the lack of people. Motors and trucks become substitutes for immigration.

A line-up of a few of the 250 two-horse carts at the municipal mata-

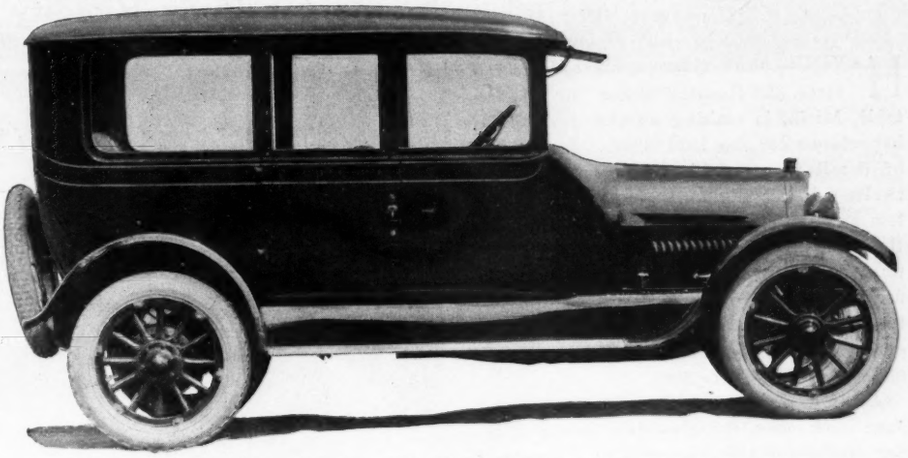
Springfield-Type Sedan Body on 1917 Reo Six Chassis

Ford Manufactures 533,921 Cars in Year—No Chevrolet Eight

A SEVEN-PASSENGER Springfield-type sedan is offered by the Reo Motor Car Co., Lansing Mich., in addition to its regular line, to be used on the six-cylinder chassis which will be continued for the 1917 season without material change. The seating arrangement in the new sedan, which sells for $1,750, follows the plan used in the 1916 touring car, that is with a passageway between the two front seats. In the case of this latest body, entrance is gained through the door into the rear compartment and the passageway gives access to the front seats.

The doors are of ample dimensions with hinged folding windows, one door on each side of the body. Removable front and rear side windows are concealed in a recess back of the rear seat when not in use. Particular attention has been given to the upholstering which is soft and luxurious, being of all-wool, grey Bedford cord, stuffed with genuine curled hair. To set this off artistically, silk bindings and heavy grey worsted carpets are matched with the upholstery.

The auxiliary seats face downward and fold flush into the front-seat backs. An electric dome light is provided with an individual switch. All metal interior fittings are nickel-plated, and the accessories include worsted braided cords on the backs of the front seats. Ventilating windows in the rear have silk roller curtains. Body finish is in lakelet green, the running gear, hood and fenders black and the wheels olive brown.



Springfield type sedan with accommodations for seven passengers

DEFLECTORS ON PIERCE

Cleveland, O., Aug. 15—With a desire to make night driving safe for its own users as well as all other motorists the Pierce-Arrow Motor Car Co. has lately adopted as part of its equipment the Sutterly offset reflectors. The blinding glare common to standard high-power headlights is removed and motorists bound in the opposite direction will be able to encounter a Pierce-Arrow without any of the annoyances and even perils that in some states have brought about legislation on the subject.

FORD PRODUCTION FOR YEAR

Detroit, Aug. 14—Ford cars to the number of 533,921 were made by the Ford Motor Co. during the fiscal year 1916, or from August 1st, 1915 to the end of July 31, 1916. This breaks by 33,921 the schedule which had been laid out for the season, or putting it in another way, is that many cars above the minimum which Ford expected to turn out during the season.

There were 294 actual working days at the Ford works throughout the country during its 1916 fiscal year, so that the daily average output was 1,816 cars as compared with an average daily production of 1,027 for the previous season.

The largest number of men working at the plant here in Detroit at any time during the year was 31,035 or double the high mark of the season 1915. What the number is expected to be some time between now and July 31, 1917, end of the next fiscal year, is being guessed by some Ford men at 50,000. Of course this cannot be until the immense additions now in course of construction are ready.

AFTER-WAR PARTS DEMAND

Detroit, Mich., Aug. 14—Manufacturers of cars in Europe, whose business came to a full stop shortly after the outbreak of the European war, will assemble cars to meet the demands of their customers immediately the war is over.

According to information received by the Wallace C. Hood Service Bureau, an organization formed to give service to American manufacturers and distributors, and also to foreign manufacturers and distributors, there will be a great demand for American-made parts and American-made accessories, from which to assemble these cars of Europe.

The manufacturers of the various countries, including England, France, Belgium and Germany, have already been in touch with the Wallace C. Hood Service Bureau, and Mr. Hood has placed one of his men, an exporter of note, at work securing all of the information desired and arranging the details through which the bureau will be able to take quick action the moment the war is declared ended.

WARNER PLANT STEWART FOUNDRY

Chicago, Aug. 14—Beginning September 1 the manufacture of Warner Auto Meters will be carried on in the new additions to the Chicago plant of the Stewart-Warner Corp., and the Beloit plant will be devoted exclusively to foundry operations connected with Stewart-Warner products. Plans have been made to double the size of the Beloit plant, the new portion being exclusively a foundry and the present building will be utilized in preparing the castings for machining.

CLAIMS CHASSIS EXTENSION PATENTS

St. Louis, Mo., Aug. 14—John C. Higdon, of Higdon & Higdon, patent attorneys of this city, has notified all manufacturers engaged in extending Ford and other chassis for the purpose of making them into truck chassis that he will hold them responsible for infringements upon basic patents held by him.

Higdon contends that his patent, No. 893,498, granted to him in 1905 before the Ford cars were manufactured, covers the work being done on Ford cars today. In his application for the patent which he holds, Higdon wrote: "The object of my invention is to provide a simple and inexpensive motor mechanism which may be quickly applied to vehicles without substantially changing any part of the vehicle." Higdon is engaged in drafting a complete statement of his claims.

NO CHEVROLET EIGHT

Flint, Mich., Aug. 14—Rumors to the effect that the Chevrolet Motor Co. is to put out an eight-cylinder car to retail at $700 are erroneous, according to W. C. Durant, president of the company.

HEAVY-DUTY TRAILERS

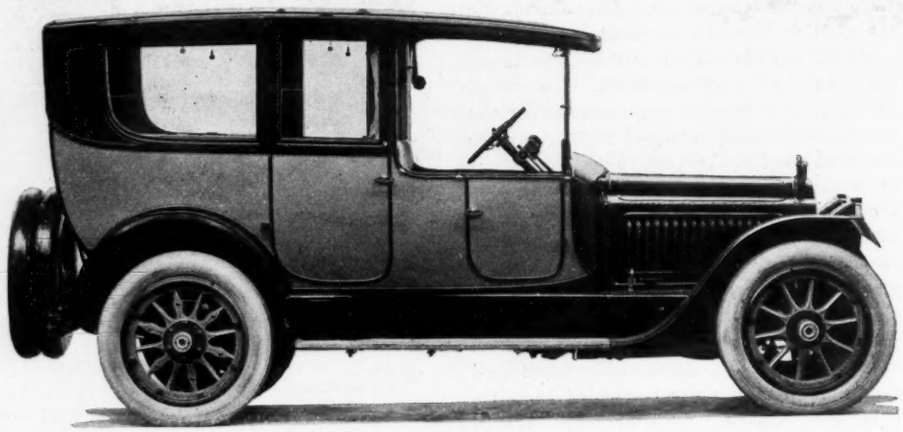
Beloit, Wis., Aug. 15—The Warner Mfg. Co., Beloit, Wis., builder of the Warner Prairie schooner for camping and touring and the Warner trailer for fast delivery work, will shortly put on the market heavy duty trailers of 2, 3 and 5-ton capacity. Specifications of the new product are not yet available. The Warner trailer coupling, another product of this company, will be standard equipment on several trucks.

Overall Height Reduced in New Packard Twin Sixes

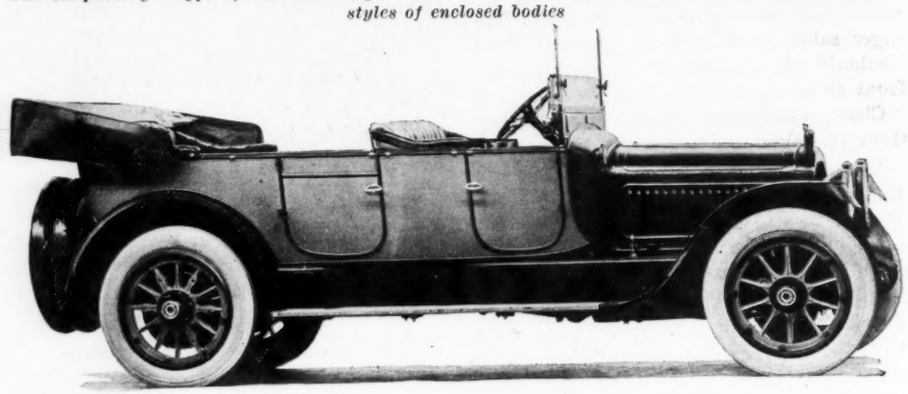
Detachable Cylinder Heads, New Water System and Deeper Frame for Body Rigidity

HAVING built close upon 8,000 twin sixes, the Packard Motor Car Co., Detroit, Mich., is making no changes of real importance for the 1917 series. In matters of detail there are improvements, but the twelve-cylinder engine, the transmission system and the chassis, generally speaking, are the same as before. The twin six Packard was entirely new a year ago, and a year's use has shown no weak spots, no major detail that had to be changed. All that has been done is to improve here and there so as to make the car still better.

As an example of the sort of changes that have been made, the alteration to the cylinder castings is the most striking. Formerly the Packard has had one piece L-head cylinders, and with these it is not commercially possible to machine every portion of the inside of the cylinder. There is advantage in having the compression exactly the same in all the cylinders, and to do this it is essential to machine everywhere, so the new car has detachable cylinder heads which do not alter the relative positions of any parts of the engine, merely permitting the full machining and, incidentally, making it easier to remove carbon deposit, as the cylinder heads are held on by twenty-five studs and nuts and can be taken off far more easily than could the cylinder blocks.



The six-passenger type of enclosed body on the smaller Packard chassis. This is one of twelve styles of enclosed bodies



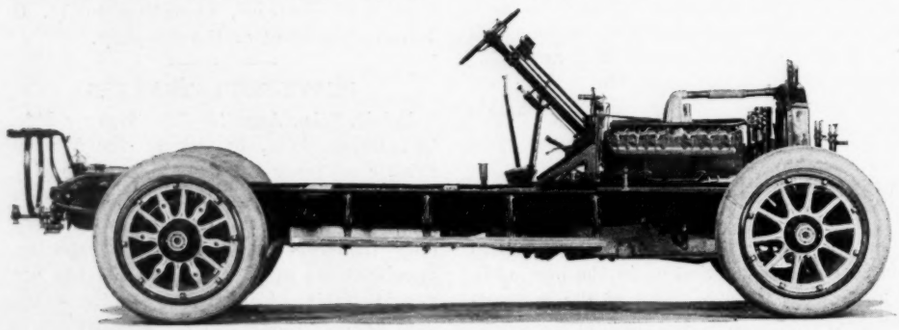
The new Packard touring car is several inches lower than last year. The downswept rear fender adds a distinguishing mark

Change in Cooling System

In conjunction with the detachable cylinder heads there has been a change in the water outlet system. There are now no separate water pipes running from the cylinder heads to the radiator; instead of these the intake manifold is surrounded by a larger pipe, which acts as the water outlet from the cylinders, and a single separate pipe then connects the top center of the manifold to the radiator. The layout makes greatly for accessibility and is excellent for carburetion. The proximity of the exhaust manifolds to the carbureter keeps the latter well warmed, and the water surrounding the intake manifold maintains the temperature of the gas.

The position of the thermostat has been altered. Instead of being beside the pump it is now mounted in the radiator inlet, that is, at the top of the radiator where the outlet pipe from the cylinders attaches. Here it admits water to the radiator when warm and when cold, by-passes the water down a branch pipe to the inlet side of the pump. This change of position means that the thermostat now occupies the point in the cooling system which normally is at the highest temperature instead of being at the coolest point.

In other respects the engine is the same as before. The dimensions are 3 inches by 5 inches, the power output about the same and the details of lubrication, etc., are precisely as on the 1916 car. The aluminum pistons have been changed to the extent that they now have the three rings located two at the top and one at the bottom, the latter acting as an oil scraper. There is also a small detail alteration to the Delco ignition distributor which causes a reduction in the current consumption, while the Bijur generator has been speeded up a little and has an increased output. As formerly the distributor is situated at the extreme front end of the engine, just behind the fan, but the coils are now located upon the left front crankcase and instead of being on the cylinders.



The new Packard twin six chassis is approximatey 2 inches lower than ast season

Frame Lowered 2 Inches

The next change which is noticeable is that the frame has been lowered 2 inches, this altering the appearance of the car in a remarkable way. Two inches does not sound a large amount, but it makes a very striking difference in looks. Packard has also abandoned the horizontal end piece on the rear mudguards, which has been a feature for very many years. The fenders now follow the curves of the wheel in a more conventional manner, and this has had the effect of smoothing out the rear end lines of the whole car, giving a much smoother general effect. The touring body is still typically

Packard, however, having all the characteristics which give this distinctiveness.

There are two lengths of chassis, the larger is 135 inches wheelbase and the shorter 126½ inches, this being an increase of 1½ inches over last year. There are 9 bodies for the short chassis and 12 for the long, and all the prices are a little higher, the advance on open cars being $115. This increase is due to the rise in the price of materials, the quality of which has not been changed. On the short chassis $2,865 is the price for the five-passenger, and seven-passenger touring cars, for the two-passenger runabout and for a new four-passenger runabout, while there is also a five-passenger salon phaeton at the same figure.

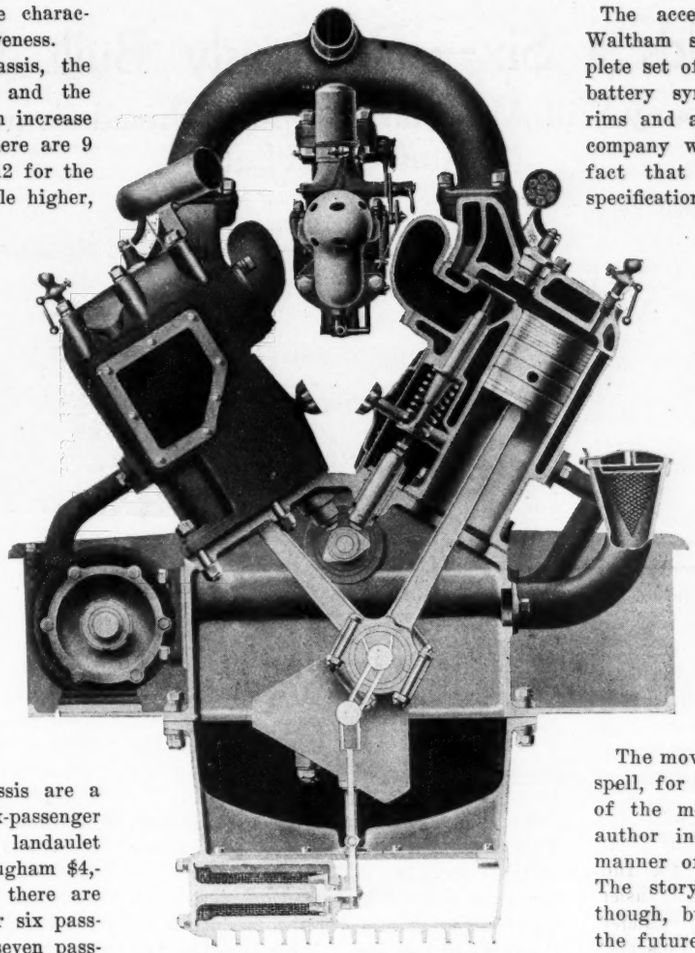
For the long chassis no runabouts are listed, but the price of $3,265 will buy a seven-passenger touring car, seven-passenger salon phaeton, five-passenger phaeton or five-passenger salon phaeton, the word "salon" signifying that the front seats are divided.

Closed cars on the short chassis are a three-passenger coupe $3,965, six-passenger limousine $4,265, six-passenger landaulet $4,315, and a four-passenger brougham $4,315 also. On the long chassis there are four styles of limousine; one for six passengers at $4,665, and three for seven passengers at $4,715, $4,765 and $4,915. There are also two seven-passenger landaulets at $4,765 and $4,815, a six-passenger landaulet at $4,715 and a four-passenger brougham at $4,715.

Powerplant Unaltered

Recapitulating some of the details that were new a year ago, and are still retained, mention may be made of the unit power plant which was new to Packard at that time and is unaltered in any way. The little Hyatt roller bearing in the gearshaft spigot has been entirely satisfactory and, owing to the smooth torque of the twelve cylinders, there has been no difficulty whatever in maintaining the quietness of the constant mesh gears. In describing the 1916 model it was said that the lubrication system, giving pressure fed oil to every moving part in the motor was probably the most thorough ever used in motor car construction. This has proved its worth, and the divided supply inside the crankshaft which gives practically an independent feed to each connecting rod lower-end bearing has worked out entirely in accordance with anticipations. The same is true of the Morse chain front-end drive with the eccentric adjustable pinion on the generator shaft end of the Lanchester vibration damper which is used as the fan pulley on the crankshaft. Axles, steering, brakes and springs are unchanged, the platform rear suspension suiting a heavy car particularly well.

Regarding equipment, all Packards will have Goodyear cord tires, 35 by 5 inches, on all four wheels, the fronts having rib threads and the rears the "all weather" tread. Kelly-Springfield or Goodrich fabric tires can be had instead if the customer so desires. The lamp variations are considerable, as there are side lamps as well as small headlamps combined with the large headlamps. The switch gear is all on the control box on the steering post and gives all the possible combinations of lighting at the touch of a finger, a feature of Packard design for some time.



Cut-away cross-section of Packard twin six motor. Improvements are removable piston heads and double passage manifold

The accessories include Sparton horn, Waltham speedometer and clock, a complete set of spare lamp bulbs, fuses and a battery syringe. Two extra demountable rims and a tire pump are included. The company wishes to draw attention to the fact that it is prepared to vary the specifications of body and equipment when so desired at an extra charge, and that there is a special department in the factory to take care of orders which depart in any way from the accepted standards.

Motorist Bookman

"A sentimental and leisurely tour of Egypt" is how Archie Bell styles his trip which gives the Page Co., Boston, another book for its Spell series—the Spell of Egypt, price, $2.50, net—and it was a sentimental and leisurely tour, according to the author's account, for he visited many of the mud villages of the land of the crocodile before entering Cairo, the mecca.

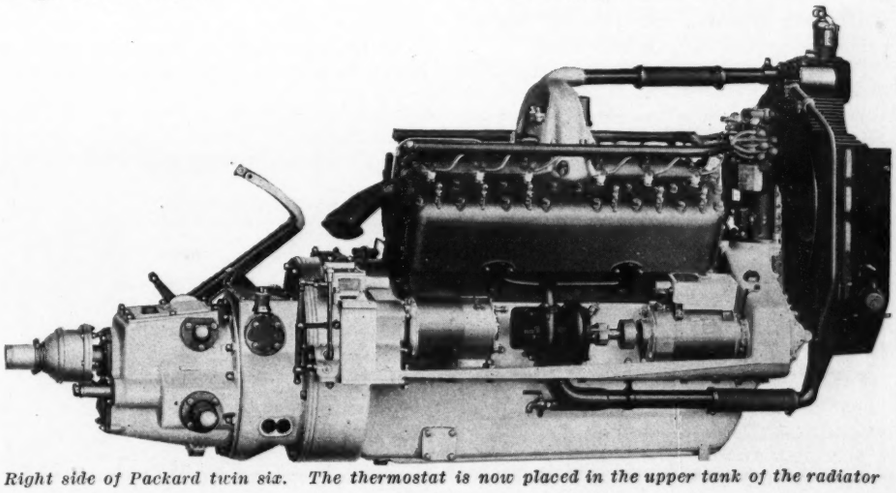
The movies are involved in recording the spell, for it is to the music of the crank of the moving-picture machine that the author inquires into the traditions and manner of living of the people he sees. The story is not of a passing people, though, but hints at greater wonders in the future, when the new world discovers more of the old world.

By Motor to the Golden Gate

Emily Post, the author, not only motored to the exposition at San Francisco last year, but she wrote the story of her trip for the benefit of future transcontinental motorists.

"By Motor to the Golden Gate" has been published in book form by D. Appleton & Co., New York, price, $2, net.

Roads and hotels, good, bad and indifferent, are included in the description of the ocean-to-ocean journey which lasted 27 days. Most of the bad roads, however, the author admits, were due to the season of the year.



Right side of Packard twin six. The thermostat is now placed in the upper tank of the radiator

Hollier Adds a Six—Previously Built Eights Only

Company Will Also Maret Popular-Priced Four to Be Announced Later

A SIX-CYLINDER car as well as an eight is now being manufactured by the Lewis Spring and Axle Co., Chelsea, Mich., and a popular priced four, which will be announced later, will be a part of the line of this manufacturer for the coming season. The six is priced $100 lower than the eight, selling for $1,085, and is a new car throughout. Some of the characteristics of the Hollier eight, however, will be found in the six also, particularly the spring suspension which is the identical 42-inch cantilever and all the chassis frame and structural work.

The six cylinders are cast in a single block with the valves in the detachable cylinder head. With the 3 by 4¼-inch cylinder dimensions, a rating of 21.60 horsepower is given according to the N. A. C. C. formula, but the makers claim a much greater output than this due to the high-speed characteristics of the engine and an advantageous shape of the combustion chambers due to the use of large overhead valves.

Valve Action Mechanism

Probably the most noticeable feature of the engine is the accessible arrangement of the valve action. This is entirely contained in the cylinder head which is detachable, thus allowing the valves to be readily ground, besides affording easy access to the pistons and cylinders. All the valves are actuated by a single camshaft by the use of a rocker arm motion. The drive of the camshaft is through helical gears inclosed steel against iron, with the gears inclosed in the usual front case and running in a bath of oil.

In the moving parts of the engine conventional practice is used. The pistons are three-ring and the connecting rods alloy-steel I-beams. Three bearings support the crankshaft which is also a special alloy of 1⅞-inch diameter. The bearings are die-cast white metal and before the shafts are mounted the running contact parts are ground to a mirror finish.

Oil is supplied by a splash system fed by gravity from a sight feed on the dash. The oil is pumped to the sight feed and at this point has sufficient head to give a positive feed to the splash troughs. The cylinders are oiled from the lubricant thrown off from the connecting rods.

Five-passenger model of new Hollier six

Vacuum feed is used for the gasoline. This is from a 14-gallon tank on the rear of the frame, the tank being connected in the usual manner by a suction pipe which syphons the gasoline to the feed tank on the front of the dash. From here the flow is by gravity to the carbureter.

In the power transmission system there is a leather faced cone clutch mounted on an aluminum casting. This has a nominal diameter of 12 inches and a 2½-inch face. The gearset is in a unit with both the crankshaft and clutch forming a unit power plant. It has three speeds forward with the main shaft made from a solid forging of chrome vanadium steel. The gears have ¾-inch faces and are also chrome vanadium steel forgings, heat-treated and ground. Annular ball bearings are used on the main shaft and on the front end of the secondary shaft, the rear end bearing being made up of a bronze bushing with babbitt lining.

Under normal load the drive shaft is about horizontal. The rear axle is floating with solid swaged tubes pressed into a housing of malleable steel. Driving gears with tooth face width of 1⅝ inches are used in connection with a four-pin bevel differential. Annular ball-bearings are used throughout. The spring seats are forged integrally with the front axle and the tie rod is at the rear. Stops are provided to limit the movement of the steering knuckles.

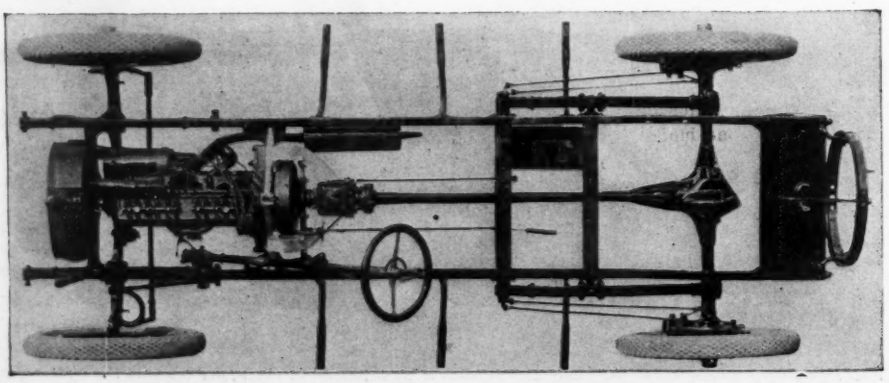
Twelve-spoke artillery wheels are used as standard. They are of hickory and fitted with 33 by 4 tires with non-skids in the rear as stock equipment. The brakes operate directly on the rear wheels and are fitted with 12-inch drums. There is a double set of these brakes, both internal expanding and external contracting being used on the single set of drums. The drums are of steel and the brakes asbestos combination.

Two Styles of Bodies

Six-volts is used for the entire electrical equipment. This is in connection with a six-cell storage battery of 80 ampere-hour capacity. The headlights are fitted with dimmers for town driving. The tail light is wired in series with the dash lamp which thus acts as a tell-tale on the tail light.

Two styles of bodies are furnished as standard. These are a five-passenger touring and four-passenger roadster. On both these bodies, which are designed to be spacious, genuine leather upholstery is used and they are filled with curled hair. The finish is in blue. Full equipment is included at the list price.

Regarding the four, it is stated that this car will be constructed and finished on lines similar to the present models, although it will be smaller and lighter. Production in large quantities is the plan.



Hollier uses the same frame and structural works on the six as on the eight-cylinder model

REPAIR WORK PRICES UP

Milwaukee, Wis., Aug. 12—Practically every garage and repairshop in Milwaukee not identified with agencies has raised

prices charged for labor from 65 cents an hour to 75 cents for mechanics and from 30 cents to 40 cents for helpers' time. The increase is one of the effects of the better business policy resulting from the organization of the Wisconsin Garage Men's Association by Milwaukee garagekeepers during recent months.

Nearly all agency service stations still keep in effect the old price of 65 cents an hour for labor, but it is stated that an increase may be expected at any time because the workmen are demanding increased pay and shorter hours. Some of the agency garages which have capacity to accept work on cars other than they handle, have increased prices to 75 cents an hour, but continue to charge 65 cents to their customers.

Accounting systems installed by members of the association proved that it was not good business to charge 65 cents an hour for labor when the workmen must be paid from 35 to 45 and in some cases 50 cents an hour. Consequently, charges were increased so that a reasonable profit might be made. Helpers receive from 17½ to 25 cents an hour, and the new rate of 40 cents an hour charged for their work gives the garage owners a more reasonable margin of profit.

At this time the organized machinists of Milwaukee are engaged in a strike to support their demand for an 8-hour day without reduction of pay from the present 52½-hour week. The employers voluntarily reduced the weekly working schedule from 55 hours to 52½ hours on July 1, but the men were not satisfied and struck for a 48-hour week. About half of the organized machinists in twenty-two of the largest metal working shops are out. None of the garages are affected, and but few of the strikers have applied for work in the garages. There has been a shortage of skilled mechanical labor for many months, but by intensive cultivation of helpers and apprentices, shops are able to produce skilled help with facility.

Manufacturers' Communications

CHICAGO, Editor Motor Age—The internal combustion engine introduced new problems of lubrication. Pistons and cylinders must be kept thoroughly oiled under the intense heat of exploding gas. This intense heat causes most oil to burn. Burning oil means carbon; carbon adhering to the metal surfaces prevents the oil from getting a chance to perform its function of lubricating the moving surfaces, which causes pitting and wear, loss of power and breakdowns.

To produce an oil that will not form carbon under the intense heat of the motor and that will maintain an unbroken film of oil between the rubbing surfaces, was the problem which confronted lubrication engineers when gasoline motors came into use. Motorists who did not realize the importance of this problem and lubricating authorities who tried to solve the problem with makeshift hit or miss oils, soon got into trouble.

Engineering Problem

The problem before the lubricating engineers was to manufacture an oil of sufficiently high fire test to place it safely out of reach of carbonization and sufficiently viscous to prevent metallic contact under extreme heat and of proper limpidity to flow under the variable conditions which exist in a motor in all kinds of weather. After exhaustive tests covering several years' experimenting, it was found that certain crude oils containing the elements desired were in existence, and a lubricating oil was then made from the same showing a fire test from 50 to 60 degrees higher than the point at which other oils carbonized and sufficiently high in viscosity to reduce frictional resistance to the lowest attainable point at the least expense if used properly in a motor.

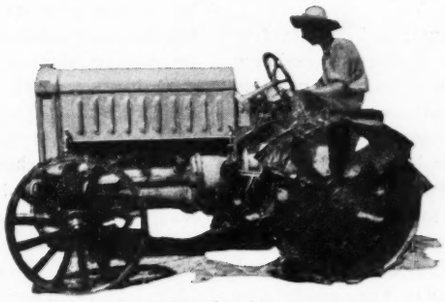
The amount of power required by any machine is the force necessary to do the work for which it is intended, plus the amount expended by the machine itself. Without any oil in use, the frictional resistance of the rubbing surfaces of the machine will consume the largest percentage of power; with an oil of ordinary lubricating capacity, the percentage of lost power will be reduced, and by applying to the bearings and cylinders an oil that reduces friction to the lowest possible point, the impediment to power will be most effectually removed.—W. D. Simmons, President, Viscosity Oil Co.

DALLAS DEALERS PLAN SHOW

Dallas, Tex., Aug. 12—At a meeting held this week at the Buick plant, with practically every car and accessory dealer of the city represented, plans were almost completed for the 1916 show in Dallas. The show will be staged on the greatest plans in the history of the local organization. It will be held during the state fair, October 14 to 31.

First Public Display of Ford Tractor

Product of Henry Ford & Son Shown at Fremont, Neb., Last Week



The Ford tractor showing compactness

THE widely heralded Ford tractor from the new factory of Henry Ford & Son, Dearborn, Mich., made its debut at the annual farm tractor demonstration at Fremont, Neb., last week. That it created a great deal of interest among visitors at the demonstration goes without saying, for the name Henry Ford carries much weight in the central West.

Those who looked to see something out of the ordinary were not disappointed nor were those who expected to see Ford characteristics in the new tractor. In fact there is Ford design sticking out all over it. There is only one model designed to operate on either kerosene or gasoline or, with some change in the carbureter, on alcohol. The tractors are not on the market as yet, nor will they be until sometime next year. Participation at Fremont seemed to be more in the way of feeling out the market than direct sales effort.

Ford's idea in bringing out the tractor, was to produce a machine of comparatively small capacity—2 mould-board plows, of as small weight as compatible with strength and wearing qualities, as simple as possible and at as low a price as possible—the same features that have made his passenger cars a success. That the designer, Joseph Galamb, has succeeded would appear from the fact that while the exact selling price cannot be announced as yet, it is in the neighborhood of $300, it weighs just under 1 ton, and it has the familiar Ford flywheel magneto, thermosyphon cooling and other elements of simplicity throughout.

The engine, is simply a larger edition of the Ford passenger car engine, its four cylinders being 4 by 4½ inches. The engine is rated at 20 horsepower and the tractor at 10 horsepower drawbar pull by the factory. It has three-speed and reverse gearset of the constant mesh type and a worm drive to the rear axle. It is capable of 5 to 6 miles per hour on road and 2.5 to 3 miles per hour plowing. The clutch is a multiple disk. Headlights for night plowing are lighted from the magneto.

One of the features of the Ford tractor is the fact that it has no frame. Radius rods from the unit power plant to the axle give the stiffening effect. The radiator is solidly attached to the engine. Four steel wheels are used. All the working parts are inclosed in dustproof housings. Either Holly or Kingston carbureters are fitted.

In the design, as at present arranged, there is no provision for a belt pulley for stationary power, but it is intended to arrange for this feature in the regular production.

Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the eighth installment of a weekly series of articles which began in Motor Age, issue of June 29, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently.

WHAT HAS GONE BEFORE

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems and the relations of current pressure and resistance brought out. This was followed by an explanation of series and multiple circuits and how electricity is made to do work in lighting, starting, signalling, etc Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained Action of primary batteries and dry cells were taken up and the best methods of connecting them. A separate section was devoted to the makeup and action of lead and Edison storage batteries.

Part VIII—Care of Storage Batteries in Service

IN order that a storage battery may give the best service it is possible for it to give, it is necessary that it receive a reasonable amount of care and attention rather than waiting until it is exhausted before the motorist knows there is such a thing as a battery on his car, or how to take care of it. If the following general rules are followed with reasonable care the operation of any good make of lead storage battery should be quite satisfactory.

I—Add nothing but pure water or sulphuric acid electrolyte of the proper specific gravity to the cells. Under no condition try to operate your battery by adding a non-freezing solution of any kind. Water must be added frequently enough to keep the plates covered as they may be seriously damaged if allowed to be exposed for any length of time. It will be found necessary to add water, more frequently in warm weather than in cool or cold weather, and for this reason it is best to make it a rule to remove the vent plugs and add the water once a week.

In freezing or very cold weather, the water should be added just before the car is started in order that the water and electrolyte in the cell may become thoroughly mixed while the battery is charging. The water is lighter than the acid and would remain at the top of the cell and probably freeze, but if charged immediately, the bubbles of gas formed when the cell is charging will serve thoroughly to mix the water and the electrolyte. Be careful not to add too much water as the cell will boil over when it starts to gas and some of the electrolyte will be lost, and it should be replaced with new electrolyte rather than water in order that the specific gravity of the electrolyte in the cell may remain practically constant for a fully charged condition of the cell.

II—The specific gravity of the different cells should be determined at frequent and regular intervals in order to determine if the battery is being properly charged. These hydrometer readings should be taken before adding the water to the electrolyte. In some cases, the electrolyte may be so low in the cell that it is impossible to get enough electrolyte up into the hydrometer syringe to float the hydrometer. Water must then be added and the cell charged for some time in order that the water and electrolyte may mix thoroughly before a hydrometer reading is taken. The condition of charge can be determined by reference to the curve given in Fig. 63, when the specific gravity of the electrolyte is known. If the specific gravity of any one of the cells in the battery is below 1,150, the cell is completely discharged or exhausted and should be removed from the car and given a special charge. In some cases it will be impossible to increase the specific gravity of the electrolyte regardless of the time of charge, which is an indication that there probably is a short circuit inside the cell and in such a case it needs the attention of an experienced battery man.

It occasionally happens that the specific gravity of the electrolyte tests in the neighborhood of perhaps 1,200 although the battery appears to be almost completely discharged as determined by a voltmeter or dim lights. This condition is due to acid having been added to the various cells to replace evaporation instead of adding just pure water, and in addition there is probably some trouble within the cell, such as plates in partial contact, etc. The battery should be given a complete charge, that is it should be charged until the voltage and specific gravity of each cell shows no change in value for a period of several hours. At the end of this charge, take the specific gravity of each cell and if it is above 1,300 draw off some of the electrolyte and add pure water until the specific gravity of all the cells test the same, which should be somewhere between 1,270 and 1,300. If the specific gravity of the electrolyte tests low, withdraw some of it from the cell by means of the hydrometer syringe and add electrolyte having a specific gravity of about 1,300 until the gravity of the electrolyte in the cell has been raised to the desired value. Remember that the cell should be charged for a period after water or electrolyte is added in order that the electrolyte may be mixed thoroughly.

III—Care should be exercised in keeping the outside of the battery clean. It should be wiped off occasionally, and the compartment in which it is placed examined for excessive corrosion due to acid from a leaky cell or perhaps from acid which has run out of the vent hole at the top of the cell. Be careful in cleaning the battery not to get any impurities into the various cells. The connections to the battery should be examined thoroughly at regular intervals to see that they are not working loose or becoming corroded. A rag dampened with weak ammonia may be used to counteract the acid in cleaning about the battery. Hard vaseline may be used to prevent excessive corrosion at the terminals.

Charging the Battery

The best results are obtained in charging a storage battery at such a rate that it will be completely charged in about 8 hours. The battery companies usually specify the rate at which their different types and sizes of cells should be charged and that rate should be followed. This charge should continue until there is no increase in either the voltage of the cell, as indicated by

a voltmeter, or the specific gravity of the electrolyte as indicated by the hydrometer for a period of perhaps 5 hours. The electrolyte in the various cells should be gassing, that is, bubbling freely, before the end of the charge.

In some cases, the temperature of the cell may become quite high during charge and, in such cases, it is best either to reduce the rate of charge or to stop the charge entirely until the temperature is lowered to a safe value. Under no conditions should the temperatures of the cell be allowed to exceed 110 degrees Fahrenheit.

If a battery is completely discharged, it may take 20 hours or more to completely recharge it at the normal rate. This time may be reduced where conditions demand that the battery be charged in a shorter time, by charging the battery at twice its normal rate during the first part of the charge and then reducing this rate to normal value as soon as there are any indications of gassing. But it is not recommended as the proper method of procedure to follow in general. The temperature of the cells should be watched carefully and the rate reduced if the temperature rises to the neighborhood of 110 degrees Fahrenheit.

In some cases the temperature may become excessive, although there is little or no gassing in the cells and the specific gravity is low. This is an indication of trouble in the cell and it should be examined by a battery man.

A storage battery must be charged by sending a direct current through it from the positive to the negative terminals. Under no conditions try to charge it by using an alternating current as this will ruin the battery. In some places alternating current only is available, and in such cases it will be necessary to convert the alternating current into direct current. There are a number of different ways of accomplishing this. An alternating-current motor may be operated from the alternating-current circuit and used to drive a direct-current generator which will supply the proper kind of charging current to the battery. A device known as a rectifier may be used to charge the alternating current into direct current. These rectifiers are in general of the mechanical, mercury vapor or electrolytic type.

If a single 6-volt battery is to be charged from a 110-volt D. C. circuit, connections may be made as shown in Fig. 65. A resistance must be placed in series with the battery, in order to regulate the value of the current and a very convenient resistance is to use a number of 110-volt 32-candlepower carbon-filament incandescent lamps connected in parallel and the combination in turn connected in series with the battery as shown in the figure. Each of the 32-candlepower lamps will allow approximately 1 ampere to pass through the battery, so if the charging rate in amperes is known the number of lamps required will be equal to this rate. When 16-candlepower carbon-filament lamps are used instead of the 32-candlepower ones, twice as many lamps will be required, as each 16-candlepower carbon-filament lamp will allow approximately only ½ ampere to pass through the battery. If high-efficiency lamps, such as tungsten, be used, more lamps will be required as the current rating of the high-efficiency lamps is less than the current rating of carbon-filament lamps.

When a 220-volt circuit is available instead of a 110-volt circuit, two 110-volt lamps must be connected in series as shown in Fig. 66. When a 550-volt circuit is available, five lamps must be connected in series and a sufficient number of these series combinations connected in parallel to give the desired charging current.

Several batteries may be charged in series more efficiently than by charging each battery alone. If several batteries be connected in series in place of the single battery shown in Figs. 65 and 66, less resistance will be required in order that the proper charging current may pass through the batteries. The reason for this is that with an increase in the number of batteries in series there is a decrease in the value of the effective pressure acting in the circuit, which is equal to the difference between the pressure between the terminals of the charging circuit and the combined pressure of all of the batteries, in series, and hence there must be a decrease in the value of the resistance of the circuit in order that the current may remain constant. There is a limit, however, to the number of batteries that may be charged in series and this limit is reached when the combined pressure of all the batteries in series at the end of charge and with the circuit closed is exactly equal to the pressure between the terminals of the charging circuit. Under these conditions there is no resistance required in the circuit and all of the energy drawn from the charging circuit is used within the batteries instead of part of this energy appearing as heat in the resistance.

Care of Battery When Not in Service

It may happen that the battery will be out of service for a considerable period, as when the car is put away during the winter months, and during this time it should not be allowed to stand without attention. If the battery is to be out of service for only 3 or 4 weeks, it should be filled with pure water and given a complete charge the last few days the car is in service by using the lamps and starting motor very sparingly. The specific gravity of the electrolyte should test between 1,270 and 1,300. The batteries should be entirely disconnected from all circuits as any slight leak will in time completely discharge it. It should be put in a room whose temperature is fairly uniform and, if possible, in the neighborhood of 70 degrees Fahrenheit.

If the battery is to be out of service for several months, it is perhaps best to send it to a reliable battery station for storage where it will receive the necessary attention from time to time. In some cases, this is not possible and if such is the case you may proceed as follows: Give the battery a complete charge by operating the engine of your car at a speed corresponding to about 20 miles per hour for a sufficient time to cause the battery to become completely charged. If direct current is available, it will be best for you to remove the battery from the car and charge it as outlined in the previous section. From 6 to 8-week intervals during the out-of-service period, water should be added to the cells and the battery given what is known as a refreshing charge; that is, the charge should continue until all the cells have been gassing freely for perhaps 1 hour, and the battery may then be allowed to stand for another similar period without attention. In the event that it is not possible to give the battery a refreshing charge every 6 weeks or 2 months, it may be allowed to stand for a period of perhaps 6 months without any

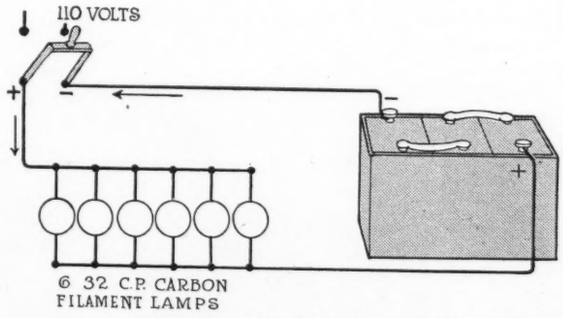


Fig. 65—Connections for charging a storage battery from a 110-volt circuit

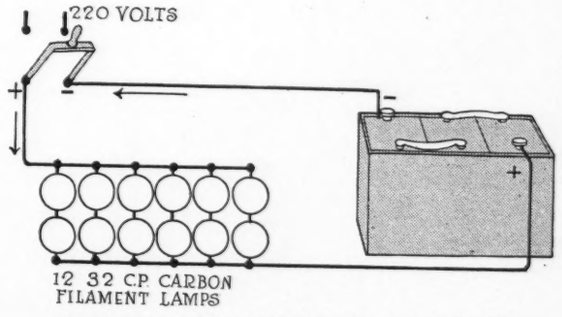


Fig. 66—Connections for charging a storage battery from a 220-volt circuit

real serious damage resulting, although it is best to give it the refreshing charge or send it to the battery station.

No matter what procedure is followed, water should always be added and the battery fully charged before it is put back into service. If the battery has stood for 5 or 6 months, without being charged, it should be charged for 40 or 50 hours at one-half normal rate before being put back into service. If the battery will not charge satisfactorily the plates are defective.

NEXT WEEK—Part IX of this series will deal with magnets and magnetism

Fremont, Neb., Tractor Demonstration Sets Record for Attendance

(Concluded from Page 15)

alcohol. This was the much-heralded tractor made by Henry Ford & Son. There were three of the Henry Ford tractors at the demonstration, one operating on gasoline, one on alcohol and one on kerosene. The new tractor created quite a stir, not only among the spectators, but among the other tractor makers. This was the first public appearance of the tractor from the Dearborn plant and the fact that Ford, father and son, were responsible for it made it an object of special interest among the farmers of Nebraska, where Fords are the most common means of locomotion. Though the specifications are not at all those of the pleasure vehicle, it has familiar Ford features sticking out all over it, as will be seen from the description on other pages.

Among tractor makers, the Ford tractor aroused much discussion, chiefly on account of its extremely low weight—1 ton—in a service where great weight has been thought essential, its absence of water pump and its worm type of final drive. The general opinion seemed to be that Ford will find a number of radical changes necessary before the actual production goes on the market next year. Nevertheless, I believe that had the Ford people come here to take orders instead of to feel out the market, scores of their tractors would have been sold on the spot—so much does the name Henry Ford mean in that section. The models on exhibition seemed to have no difficulty in doing their stunts in the plowing demonstrations, except a reprimand or two from the judges for speeding; that is, plowing faster than the advertised plowing speed.

All of the tractors in fact were exceptionally free from stoppages due to mechanical troubles. With one or two exceptions, all the machines dug in and finished up their task in a steady and businesslike way that was an eye-opener to the novice in tractordom.

Tractor Prospects

Marketing of agricultural tractors differs from the marketing of motor cars in one essential respect. If a farmer, or any other man for that matter has sufficient of worldly goods to buy and maintain a motor car, he is considered at least a possible prospect. But when it comes to buying a tractor for tilling his fields, there enters another consideration, and that is, "Will it pay?"

The answer to this question involves a number of considerations but the chiefest of these, particularly in level country, is the tillable acreage.

The Department of Agriculture has found that in general on level land, a tractor will pay, if properly managed, when the tillable acreage is not less than 160 acres. According to Nebraska real estate men who have been in touch with conditions in this territory for years, the average is in the neighborhood of 1,000. It is on the larger farms that the tractors have been operating for the greatest period and with the most success.

One land-owner, whose holdings approximate 1,200 acres of corn and wheat lands, has been operating two very large tractors for several years and this week purchased two smaller ones of the same make to use in addition to his larger ones. To a certain extent it is the smaller-capacity and less expensive tractors that are popularizing these machines in this territory. A big, heavy, expensive machine capable of pulling eight or ten 14-inch plows represents too much capital to the owner of 240 or 360 acres, and its capacity is so great that there is not work for it on one farm a sufficient proportion of the time. It has been found as a general rule, that to keep the machine sufficiently busy by doing custom work on other farms is not a paying propostion.

The later types of smaller, lighter and less expensive tractors capable of handling from two to four plows, seem in the opinion of a large proportion of the farmers in the territory, to meet the demands of the moderate-size farm, and with many of them, the purchase of a tractor depends on present prosperity and future crop prospects.

The August crop report for the state of Nebraska as compiled by the federal bureau of crop estimates August 1 together with the actual production last year, is given below. It should be borne in mind that last year's production was approximately 120 per cent of the normal yield for the past 5 years; also that this estimate was made before the general rains of this week, which put hundreds of thousands of dollars in the pockets of the Nebraska farmers and in the minds of some, meant a full corn crop instead of a partial one.

CROP

	AUGUST 1, 1916	1915
Corn	180,000,000 bu.	213,000,000 bu.
Winter wheat	61,600,000 bu.	66,618,000 bu.
Spring wheat.	4,560,000 bu.	5,536,000 bu.
Oats	75,100,000 bu.	70,400,000 bu.

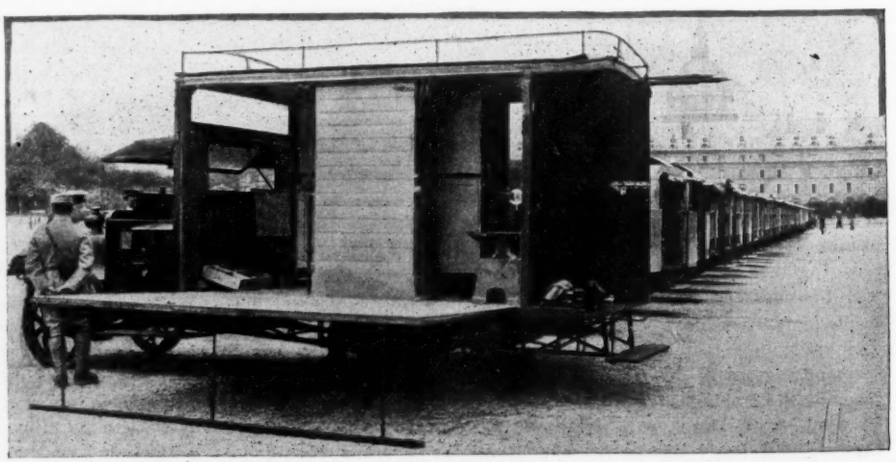
Fremont markets August 9, 1916 quoted No. 2 wheat at $1.30, No. 3 corn at 75c and oats at 35c per bushel. On August 1, 1915 wheat was 29 cents less; corn, 5 cents less and oats the same. Live stock and dairy products last year put $244,000,000 in the coffers of the Nebraska farmer and this year will do as well.

EXPORT FIGURES SHOW GAINS

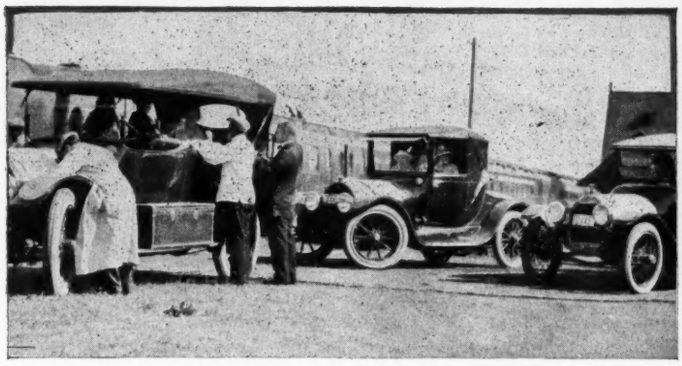
Washington, D. C., Aug. 12—Figures show that this country exported 77,496 motor cars, valued at $97,464,381 during the fiscal year ending June 30, 1916. The United Kingdom tops the list of countries importing American cars during the last fiscal year, the shipments to that country amounting to 18,428 cars, valued at $26,147,882. In value of imports of cars from this country France ranks second, 7,768 cars, valued at $19,137,904.

Third place is occupied by Russia, which country bought 5,177 cars, valued at $15,686,874 during the last fiscal year.

This year Denmark figures in the export returns to the extent of 847 machines, valued at $585,384, and under the heading "other Europe," 2,673 cars, valued at $3,402,422, were exported during the last fiscal year, as against 4,249 cars, valued at $10,720,541, exported in 1915.



Line of ambulances presented to France by England. In front is one of the workshop cars for repair work



Feeding tourists ice cream cones from Northern Pacific dining cars at Little Falls, Minn.

Bulldogging a steer at Medora for entertainment of tourists safe behind wire fence

Wild West Thrills Greet National Park Tourists

Indian bride and groom visit tourists at Billings, Mont. The Indian at the right was best man

Chalmers confetti car at Mandon. W. H. Brooks is at the wheel

W. W. Smith of Fargo, N. D., president of the National Parks Highway Association

J. P. Hardy, secretary National Parks Highway Association

Lower left—Mrs. Bohn E. Tanks, Mrs. F. P. Sheldon, both of Minncapolis; Mrs. W. L. Davis, Eau Clair, Wis., and Miss Morford, Hattiesburg, Miss., on pilot of special's locomotive ready for trip up Yankee Springs canyon. Center—Typical cowgirl at Medora drinking pop. Oval—Awarding the cakes on the return trip. The delicacies weighed 50 pounds each and were given to Mrs. F. P. Sheldon, Minneapolis, the only women driver, and A. E. Santwier, who had no tire trouble

How France Makes Military Chauffeurs

Part II—Training Touring Car Drivers

By W. F. Bradley

AN army truck driver for convoy formations can be trained in 15 days. A capable touring car driver cannot be produced in less than 6 to 8 weeks. This is the experience of the French army authorities in the training of thousands of men who have not had previous motor car experience.

From their various regimental depots the men are sent in batches to a big touring car school, which did not exist a few months ago. Everything has had to be obtained since the outbreak of war; officers and instructors; sheds for the men to live in; kitchens in which to cook their food; shops for repairing the trucks, and a uniform program of instruction calculated to produce the best drivers in the shortest possible time.

Instructor explaining the construction and operation of a carbureter to army drivers

The methods adopted for the training of a touring car driver are entirely different from those applied to the production of a truck driver. The latter is rarely, if ever, called upon to work entirely unaided. The touring car driver, on the other hand, must always be independent of outside help and sufficiently expert to get his car home no matter what conditions may be met with en route. Speed is a difficulty. While any ordinary man, without previous experience of motoring, can be trained to drive a truck, a certain proportion of recruits more than 30 years old are naturally incapable of becoming the drivers of mile-a-minute cars.

Theory and Practice Combined

The method adopted at the leading French army touring car school is a judicious combination of theory and practice. Except when weather conditions are altogether unfavorable, instruction is given on a broad shady avenue by the side of a river, all approaches to this avenue being barred by sentinels. Just as in the old school days, the pupils are divided into classes, of which there are about a dozen, each one in charge of an instructor.

The sight of this modern military open-air touring car school is not lacking in picturesqueness. At the entrance to the avenue about thirty men are gathered around a sectioned motor car chassis. The machine is a Darracq of simple construction, from which the radiator has been removed and the front of the timing gear housing taken away. Parts of the water jacket and the cylinder walls have been cut out of No. 1 and 2 cylinders, so as to expose the two pistons. A color scheme has been adopted as an aid to comprehension. Thus the water pump, the inlet and outlet water pipes and the exposed portion of the water jacket space are painted a uniform color. The accelerator, the gasoline feed pipe and the carbureter are another color. The brake pedal, rods, shoes and drums have all been daubed from the common pot, and so on throughout the entire chassis, thus making it easy for the novice to trace the connections from one part of the machine to another. In this class elementary instruction is given to men who have, for the most part, entered the school without any notions of motor car construction and operation.

In the center of the next group is a practical object lesson consisting of a touring car with its rear axle jacked up and its front wheels locked. Here the men are learning to crank the motor and to change gears, the latter operation being one of the most difficult the instructors have to teach. The gearbox cover is removed, and first the pupil is allowed to watch the revolving gears. As soon as he has realized that the object of the change speed lever is to put into engagement sets of gears of different diameters, it is insisted that he make all changes with his eyes on the road ahead.

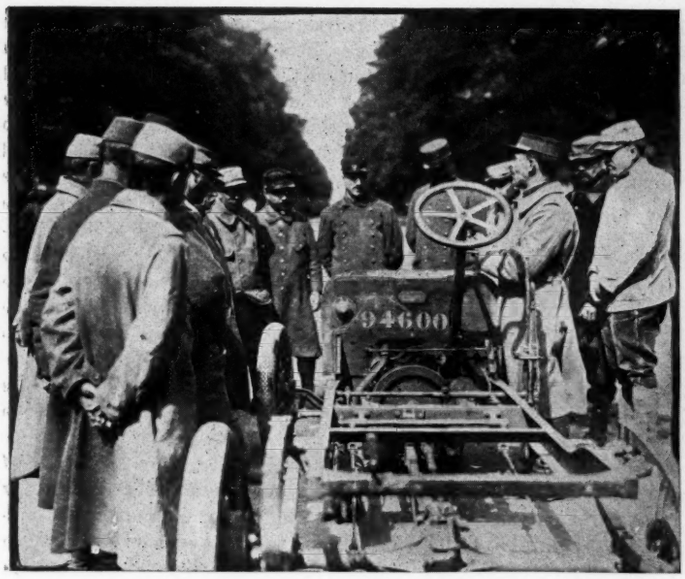
Following the gear-changing classes there are two others dealing with pneumatic tires. A large portion of the pupils are not aware that a pneumatic tire comprises an outer casing and an inner air tube. This is explained to them, and also the manner of mounting and demounting tires and inflating them to the correct pressure.

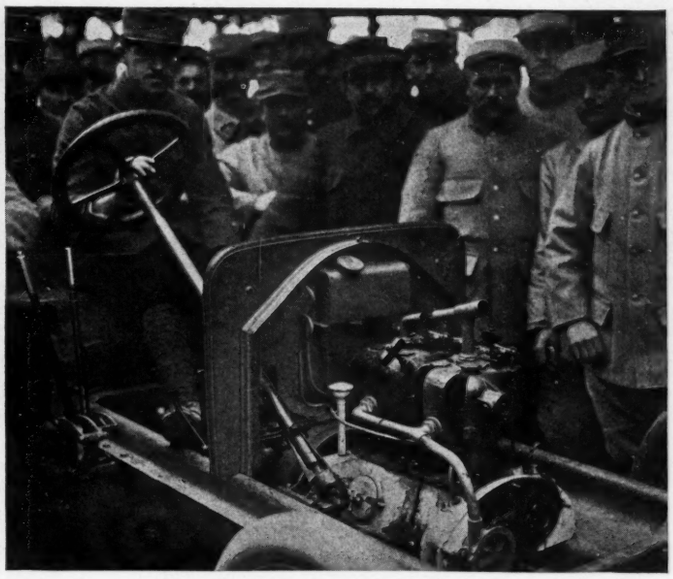
Three Classes Are Compulsory

These three classes, dealing with elementary motor car construction, gear changing and tire manipulation, are compulsory for all pupils, whether they are going to be drilled into expert motorists or by reason of their mediocrity are destined to be transferred to the separate truck school. Other and more advanced classes deal with the theory and construction of carbureters; still another handles the problems of ignition by high-tension magneto, battery ignition evidently being ignored in this school. In another class gearbox design and gear ratios are dealt with, and still further along the interest is centered around rear axles.

The working day is divided into two parts: the men who have been in the open-air classes in the morning spend the afternoon on the road, while those who began the day with driving are given theoretical instruction in the afternoon. This method of alternating theory and practice is found to be most conducive to rapid progress, the two methods of instruction being complementary. Four men and an instructor are put aboard each car, the school machines comprising practically every known French make, together with a sprinkling of foreigners. The men do not adhere to any one car during their period

Recruits waiting to go out for a road driving test





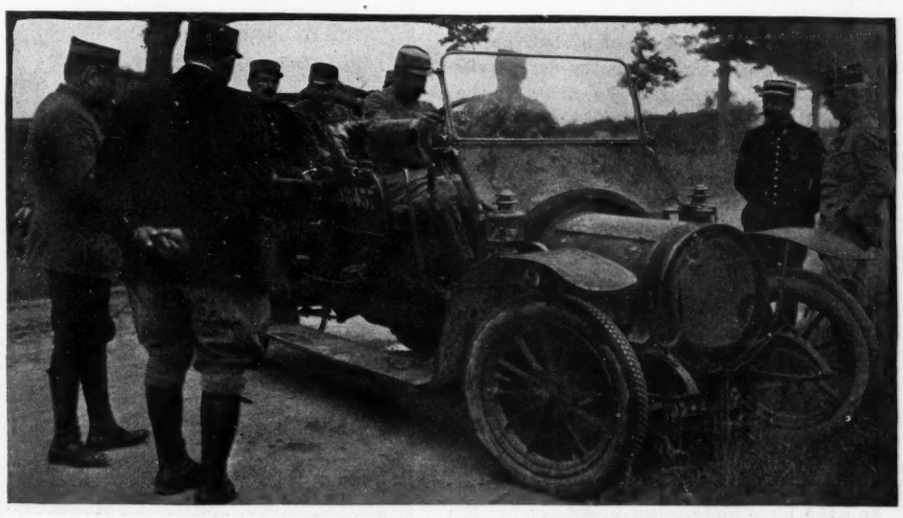
Left—French soldiers at an army touring car school studying motor construction as exemplified in the Darracq. Right—Instructor giving a lecture to future drivers

Officer-inspector questioning pupils who have had only a few days' instruction

of instruction, but change practically every day, so that from the outset they become habituated to different types of control and all kinds of gate and sector change speed mechanisms. The school machines are not modified in any way for instructional purposes, and although the instructor is always by the side of the pupil he does not interfere unless it becomes necessary in order to avoid an accident. Thus, the recruit feels his own responsibility.

During the elementary stages of instruction the cars are confined to a 5 or 6-mile circuit comprising dead level roads with plenty of by-lanes. Straight ahead driving is not encouraged, the men being constantly called upon to turn, reverse, stop, start and go through the train of gears. Each man takes his turn at the wheel while the three others remain silent and listen to the criticisms and advice of the instructor. By working on a small circuit it is possible for the school officers to supervise the instruction and give individual attention to the pupils during what is undoubtedly the most critical period of their instruction.

After some skill has been acquired in the handling of the steering wheel and the levers, it is no longer possible to confine the drivers to a closed circuit. The men then go out in convoys over give and take roads, mostly of a hilly nature, the entire convoy being in charge of an officer. As they near the end of the course the men are put on faster cars and every day each man gets about 30 miles actual driving on a machine capable of 60 miles an hour. No driver is considered competent until he has spent two weeks in the repair shops, forming a team with a couple of skilled mechanics. Night driving tests have also to be successfully passed, these of course being undertaken without any lights on the cars and over unknown and unlit roads. The army touring car driver must be capable of all kinds of running repairs and of getting his car going again after a breakdown in the shortest possible time. As a test in this connection, the driver goes on the road in company with an under officer, and during the trip his car is disabled. On the skill shown by the man in getting his car back to running condition will depend the number of points given him in the examination. Most of these men, when sent to the front, will have to carry officers or may be entrusted with important messages to be delivered to units in the field. As any delay or failure to reach the destina-



In the early stages of the course special attention is paid to turning and reversing on roads of ordinary width. The instructor is sitting by the side of the driver

The dinner bell has sounded and the pupils bring their demonstration cars home

tion might have serious consequences for the armies involved, it is most important that the men should be capable of handling their cars with skill and intelligence under all conditions.

Every week a certain number of men leave the school for a central motor car depot, from which they are allotted to the armies in the field requiring their presence. Generally on entering the school their military equipment is incomplete, but on leaving that institution they are uniformly dressed in the light blue uniform of the active army. With a steel helmet on the head, a red badge with the letter A on the right arm—signifying "automobile"—a kit bag over one shoulder and a rifle over the other, they go forth to active service. For a large proportion of them there is no novelty in going to the front, for these newly made drivers are old soldiers who have been wounded and rendered incapable of further service with the fighting forces. It is a general rule that men shall not be admitted into the army motor car service if physically fitted for the firing line.

Huge Repair Department

In connection with this school there is a huge repair department for all kinds of pneumatic-tired motor vehicles used in the various services behind the lines. No trucks, or any kind of vehicle running on solid rubber tires, are handled in this section, and although generally known as a touring car repair depot, a more correct designation would be pneumatic-tired motor car repair department, for ambulances and light vans form a sprinkling among the touring machines.

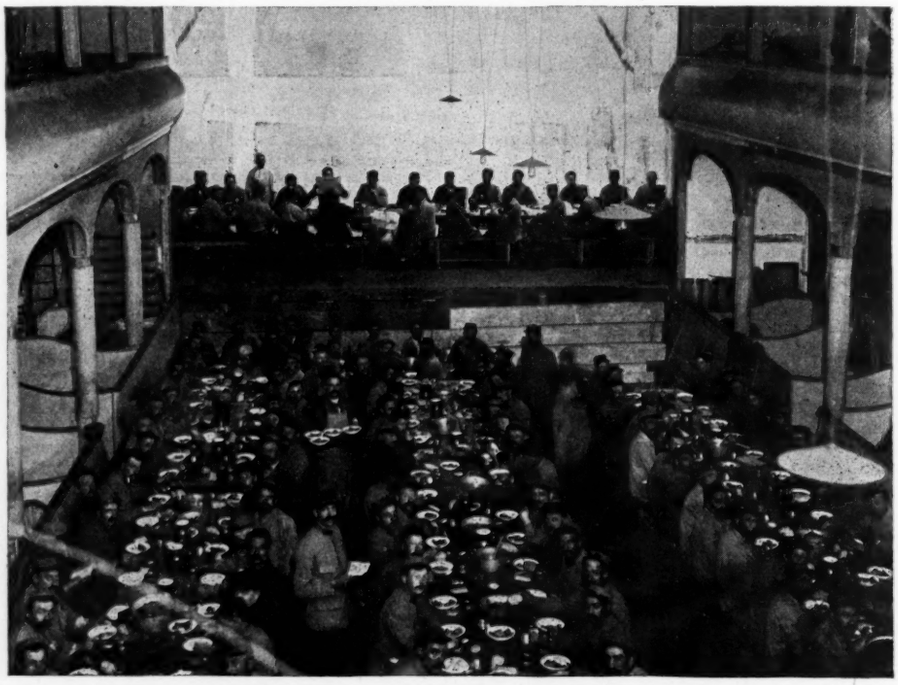
This depot, which handles —* cars per week, stands back of the reserve armies and the huge mechanism necessary for the feeding, clothing, housing and provisioning of the immense armies in the field. It will probably be imagined that there is less romance and a considerably diminished element of danger compared with the motor car services of the fighting forces. But while there is not much danger of these cars being destroyed by shell fire or wrecked in shell holes on a bombarded road the casualties are increased by the fact that the men handling the reserve cars are not so skilled as the drivers at the front.

There is more variety in this repair shop than in any motor car establishment in any part of the world. In addition to a score of modern types of well-known French makes, the mechanics must be capable of handling such widely contrasting designs as a Ford and a Lanchester; a 1902 superimposed valve Metallurgique and a 1915 Packard; a Bugatti with cylinders like a liquor glass and a Mercedes with a capacity of a couple of litres in each cylinder.

All this repair organization has had to be got together hurriedly since the war, a task the difficulty of which will be understood by any person who has had to deal with motor car repairs on a big scale. Although the number of vehicles permanently on hand runs into hundreds, it is not possible to specialize to any great extent. Every car received for repair is examined, tested if necessary, and then reported on. It is then turned over to a group of three mechanics, who carry out all the repairs indicated on the docket, but are instructed to report if in their opinion any defective part has been overlooked. Attempts to specialize by forming motor, gearbox and rear axle teams have been found to be impracticable, owing to the varying nature of the work and the variety of cars handled. Fluctuations are so great that some of the teams would be overworked while others had nothing to do. Making a single team responsible for the entire car limits and defines responsibility, rendering it possible for the officers to come back on the culprit if complaints are received after a car has returned to service. Naturally there are special sections for the repair of radiators, for acetylene welding and for the various kinds of machine work. Generally, owing to the necessity of waiting for spares or parts being machined, each group of mechanics will have three or four machines on hand at once.

Labor Shortage Is Felt

At a time when the army is clamoring for every able-bodied man, when the munition factories are jealously guarding every person capable of running a machine and when the newspapers are crowded with advertisements for machine shop hands, the military repair depot is bound to feel the effects of the labor shortage. A majority of these soldier-workmen have had experience in the motor car factories. Others, who at the beginning of the war were only semi-skilled men, have since become capable of doing first-class work. It has been found, for instance, that an intelligent village blacksmith, who has worked on agricultural machinery but never laid his hand on a motor car, can be put with a couple of mechanics trained in



Housing of the auxiliary forces created by the war is often a difficult matter. Here a theater has been requisitioned for use as a dining hall by the mechanics and drivers

* Deleted by request of French war office

the motor car factories, and in a few months he will be almost equal to his instructors. The war is increasing the number of skilled mechanics in altogether unexpected proportions.

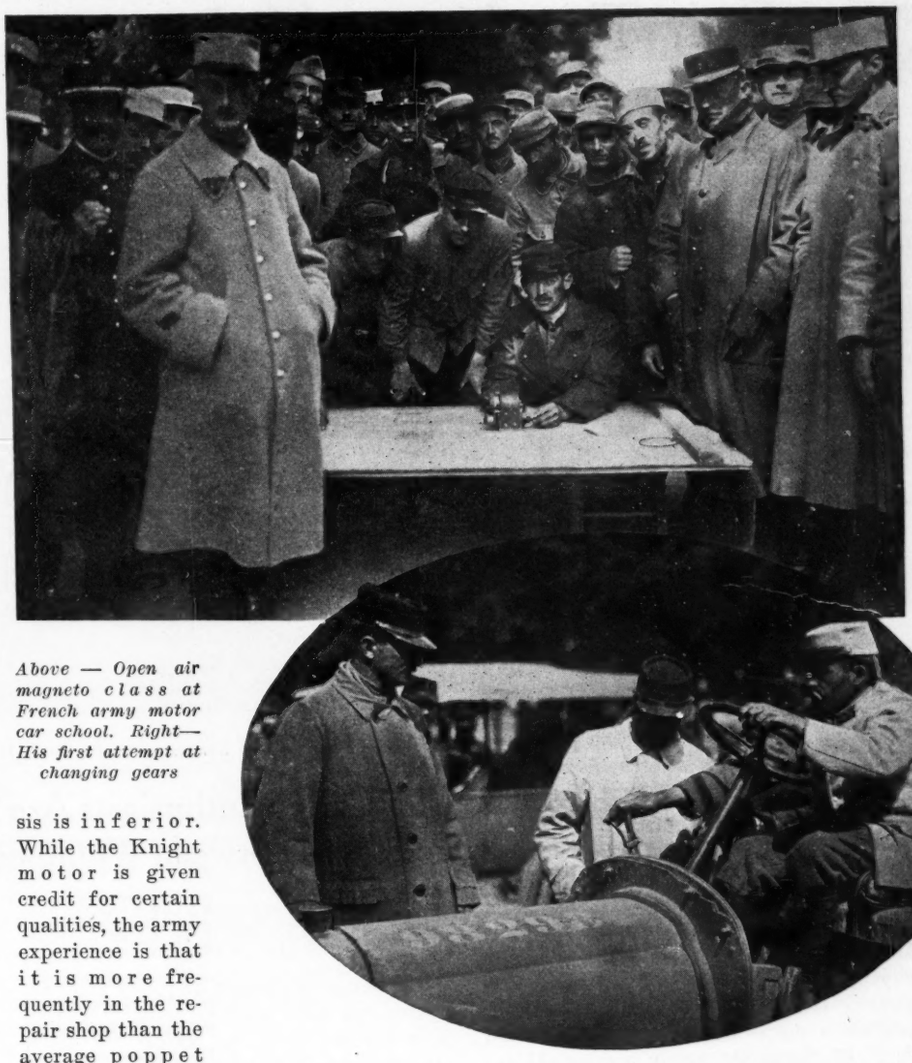
It is interesting to note that very few of the officers are men who have graduated in the motor car factories. For various reasons, which it is not desirable to amplify here, the professional motor car engineers have been returned to their respective factories and are doing good work there. The repair depot engineer-officers are skilled men drawn from various branches of mechanical engineering, who come to the motor car without any prejudices or preconceived ideas in favor of this or that make.

Cars Have Weak Points

It is not an easy matter to tabularize the defects revealed in this repair work. Every vehicle is found to have some weak point when put in war service or placed in the hands of an unsympathetic driver; but what may be the weak point of one is probably the strong point of another car. Speaking generally, universal joints give a considerable amount of trouble; there is also a lot of repair work on gearsets, owing to unskilled handling; motors still call for much attention, owing to defective lubrication systems or inability of the drivers to give the necessary attention. Rear axles are not a very prolific source of trouble. Even here, however, there are considerable variations. As an instance, Renault and one other high-class make were performing similar service of an arduous nature. The Renault, which has a one-piece forging axle housing, developed no trouble in this organ, while the other make, with a built-up axle housing, had against it several fractured housings.

The officers in charge of the repair work are not, on the whole, partisans of forced feed lubrication for war conditions. Their experience is that foreign matter is not kept out of the oil, and under a pressure system this matter is forced into the bearings with destructive effects. The system which, in their opinion, keeps the motor in the best condition is the circulating constant-level splash adopted by Panhard-Levassor. Under this system the oil is fed to the front trough and overflows to those behind it, the supply of oil being proportionate to the throttle opening.

On the question of poppet valve versus Knight motor it is worth recording that these engineers consider the poppet superior for war conditions. They have had experience with three different makes of Knight motors: English-Daimler, Panhard-Levassor and Minerva. The English-Daimler motor is considered superior to the others, but the chassis is inferior. While the Knight motor is given credit for certain qualities, the army experience is that it is more frequently in the repair shop than the average poppet valve engine. This is ascribed to the fact that its lubrication requires more careful attention than the average army driver can or will give to his engine. It is not merely a case of neglecting to give a sufficient quantity of oil but of not selecting a lubricant of the right quality, of not verifying the working of the pump and of not keeping the oil free from impurities.

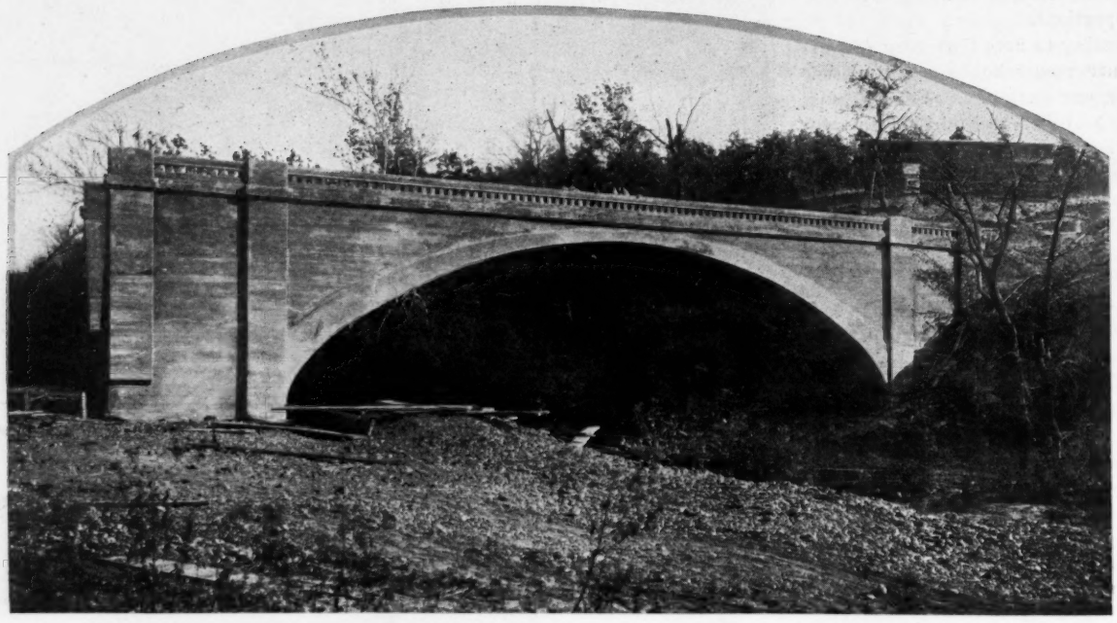


Above — Open air magneto class at French army motor car school. Right— His first attempt at changing gears

During the visit to this formation it was realized that there is not much practical patriotism in the donation of old touring cars to the army for Red Cross service. On several occasions well-intentioned English people have gathered together all kinds of touring cars which, after being stripped of their original bodies, have received an ambulance body and been sent for service with the French troops. Many of these gifts were old chassis, only fit, with considerable coddling, for service at home. Among them were noted chain-driven Napiers, which must have been built not later than 1902. The inevitable result was that such vehicles were wrecks by the time they had completed the journey from the coast to the front, and had to be returned to a repair depot, where the officers hesitated to waste good labor on them. The cheapest new American car would have given better service. However, through study of these old touring cars, the soldier-pupil becomes efficient and is able to meet properly the vicissitudes of motoring later on when he is far away from field repair shops. No car goes to waste.

School cars returning after a driving test on the road

The Path That Unites the Pines and Palms of America



Type of bridge on "The Trail of the Lonesome Pine" in Southwest Missouri

Jefferson Highway and What Its Enthusiasts Are Doing to Realize Their Dream of a Year Round Road Between Winnipeg and New Orleans

A PRIVATE car on rubber tires is to have a showy part in the attempt to hand-surface the Jefferson highway before any other cross-continent highway is completed. It is being designed now—a modern office on a motor car chassis—and J. D. Clarkson, the newly appointed general manager of the highway, vows that he will live in it until a 365-day roadway is complete from New Orleans to Winnipeg.

To those who know "365-Day" Clarkson the achievement of this purpose is not impossible. The plan to build a movable office, equip it with a desk, letter files, dictating machine and other necessaries for the efficient handling of the highway business is merely a typical Clarkson method. He always seeks the unusual and claims vindication for it in miles of road built.

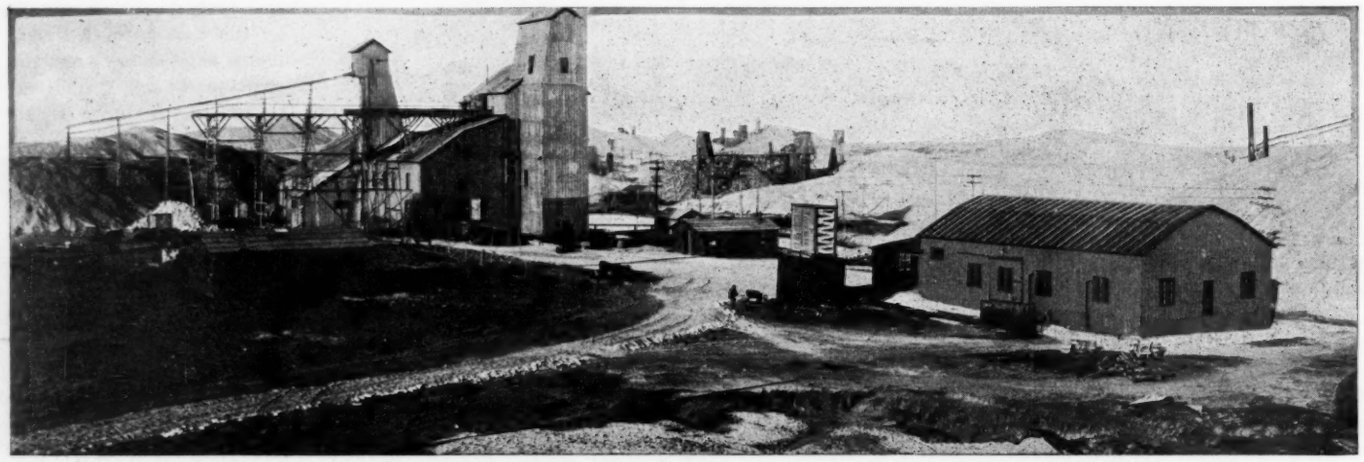
His first promulgation of policy after assuming his new position recently caused consternation along the route. The plain, raw truth would be told of the highway, he declared, and all inquiries regarding its condition would be understated rather than overstated.

"We will profit by the mistakes of other highways," he said. "We propose to make friends of motorists and not victims."

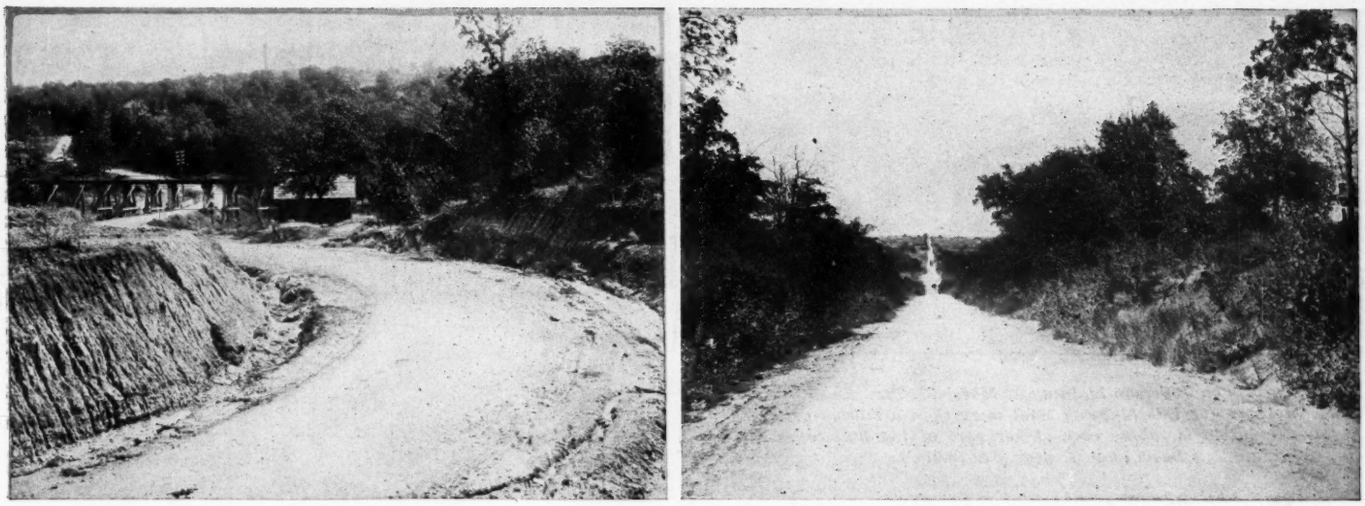
More than that, he declared an ounce of competition was worth several pounds of argument in building roads and that all a competing section had to do to capture the route was to build a better road. This has proven a big spur to building activity. An instance is the case of Arkansas.

Arkansas was for all practical purposes not represented at the first Jefferson highway conference in New Orleans last November. There were nearly 500 delegates there from eleven states, but Arkansas had but one of these. The conference developed into one of the most sizzling road meetings the Middle West ever beheld, and voting delegates counted in results, so the route went to Oklahoma and Texas, and prospects for Arkansas' participation in building the highway looked bad.

February 3 a meeting of the executive board was held in Kansas City. Arkansas was there with thirty-eight delegates and



Among the gravel mountains at Joplin, Mo. Sixty miles of the highway is already graveled with crushed flint from the zinc and lead mines



Left—A stretch of good road near Denison, Tex. Grayson county has 356 miles of hard-surfaced roads that cost $1,555,000. They were constructed by bond issues. Right—Waterbound macadam road near Denison

two certified checks for $10,000 each. This money was raised by passing the hat and was exhibited as a guaranty of the state's willingness to build a scenic road through the Ozark mountains.

The rivalry between western Missouri and eastern Kansas also flamed up and the feeling approached that of the border warfare days of the civil war. Both routes are working feverishly to hard-surface rival roads a distance of 200 miles between Kansas City and Joplin, with the agreement that the official marks will be given the road that is in the best condition next Labor day.

Local Branches are Rivals

To whet still further the keen desire of the Kansas route, local contests between rival branches of the Kansas section of the road have developed. Pleasanton and Osawatomie each represent one of these branch road fights and each bids for recognition with relics and scenes of John Brown's activities and is pushing bond issues to make roads fit for modern days. In a lesser way the same rivalry exists all along the 1,800 miles of the highway.

But back to Clarkson and his methods. Just to be different he registered himself, "The Jefferson Highway Man" at the first town on his preliminary trip over the highway. The hotel clerk had to be satisfied with that. "If I get any mail it will be by that address," he said.

But the town was not to be outdone, and it showed him some unusual things too. That was at Bethany, Mo., population 1,981 by the 1910 census. Bethany brought approximately 2,000 visitors to town to meet "The Jefferson Highway Man." Many of them were farmers. Three special trains were required to transport them and three brass bands led the procession down the bunting-bedecked streets. Twelve hundred visitors took part in the dinner given by the Bethany Community Club, presided over by a farmer who lives 5 miles from Bethany. It was perhaps the greatest meeting of its kind in the experience of the state.

That simply illustrates, in a way, some of the enthusiasm that abounds along the highway and the hunger for good roads which the manager hopes to coin into action. His first move will be to organize the towns. This he does under what he calls the "365-Day Road and Community Club plan," an idea he originated.

Following this work he proposes to run a train or road building machinery over the route and build a demonstration mile of road in every county where encouragement is needed.

"Make roads a bargain and people will buy them," says Clarkson.

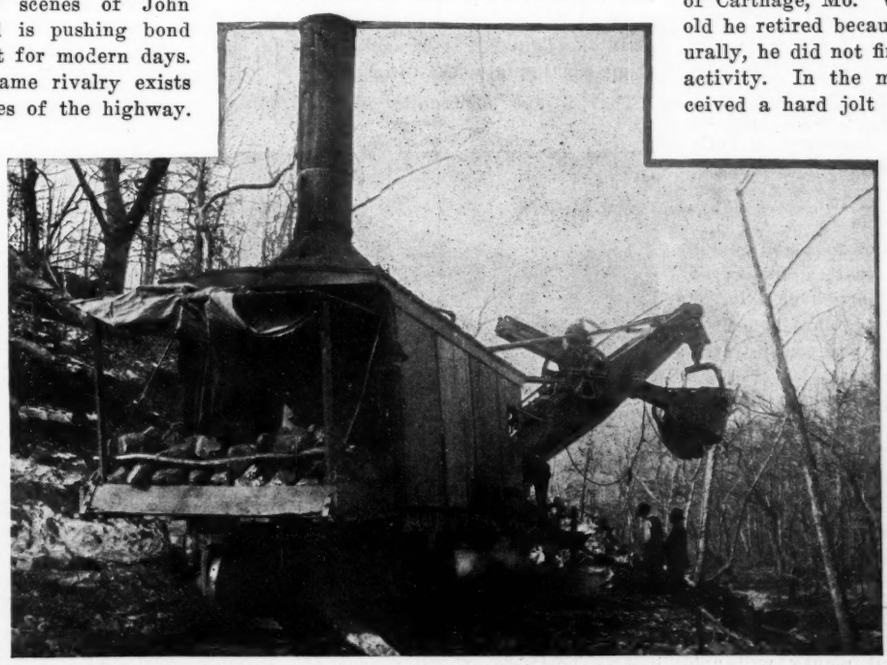
Organizations Are Planned

To mark down the roads in price he advocates the use of common sense and modern road-building machinery. His train will consist of a distillate tractor, graders, harrows, a rock crusher, gasoline trucks to haul material and some devices of his own he is giving to the highway for free use.

The real feature of his work, however, will be his interesting organization methods, and these are easiest illustrated by the story of his own entrance into the road building work.

Mr. Clarkson was an implement dealer of Carthage, Mo. When he was 50 years old he retired because of ill health. Naturally, he did not find better health in inactivity. In the meantime Carthage received a hard jolt when the 1910 census figures were given out. It discovered it had grown only sixty-seven in population in 10 years, and instead of being a growing town of 12,000, was actually a town of 9,483. But of more interest to Mr. Clarkson was the fact that Clarkson row was without tenants most of the time, so he took up road building to regain his health, to help Carthage and to help rent Clarkson row.

He organized the 365-Day Road Club of Carthage. He



Near the "Shepherd of the Hills" country. Digging out the Jefferson highway in the Missouri Ozarks with modern road-building machinery

Left—Concrete on Jefferson highway at Marshall, Tex. Recent bond issues in Texas for this highway total more than a million dollars. Right—Minnesota is taking care of her part of the highway. At Lake Phalen, near St. Paul

set out to get a hundred merchants and professional men of the town to pay $5 a month to promote good roads. The agreement was that no signature would be valid until the hundred names had been procured. This clause saved the day. He got the hundred names.

The club bought modern road-building machinery on time payments and hung up most of the $6,000 collected annually as a prize. Whenever farmers raised money to improve a road, the club duplicated it from the prize fund, and then the club and the farmers went to see the county court.

Proceeding on the theory that twenty men who are organized and who are demanding something are more influential than the remainder of the voters of the county who are unorganized, a picked delegation would visit the court. One man acted as spokesman, the others by instruction would look at the judges and say nothing. The judges were left to surmise what they were thinking.

The spokesman would tender the money raised by the farmers and the club. He also would offer the use of the modern road machinery and the expert in charge of it. The judges were asked to supply the remainder of the money necessary to build the road out of tax money. Invariably they agreed.

County Helps Build Roads

In this way 122 miles of rock and gravel roads were built in 5 years. Instead of spreading the county money over a lot of dirt roads where it washed into the ditch with each rain, the money was concentrated on main line trading roads.

During the last 2 of the 5 years referred to, the proposition ran on its own momentum. That is to say, the farmers were willing to put up the entire bonus, and the merchant members of the club were not assessed. The club merely continued as the leader and Mr. Clarkson served as its manager without pay.

"If the average community ever obtains its money's worth in roads, some one should give service that money will not buy," he said in justifying his part in the work.

But the fate of Clarkson row furnishes the most illuminating part of the account. At the beginning of the road building campaign a trade census of Carthage was taken. Every merchant was asked to tell how far in each of eight directions he had three customers. The average of all their answers was reduced to a map showing the trade territory and the number of miles in each direction to the average 3-customer limit. It was a great deal more circumscribed in extent than most of them had anticipated.

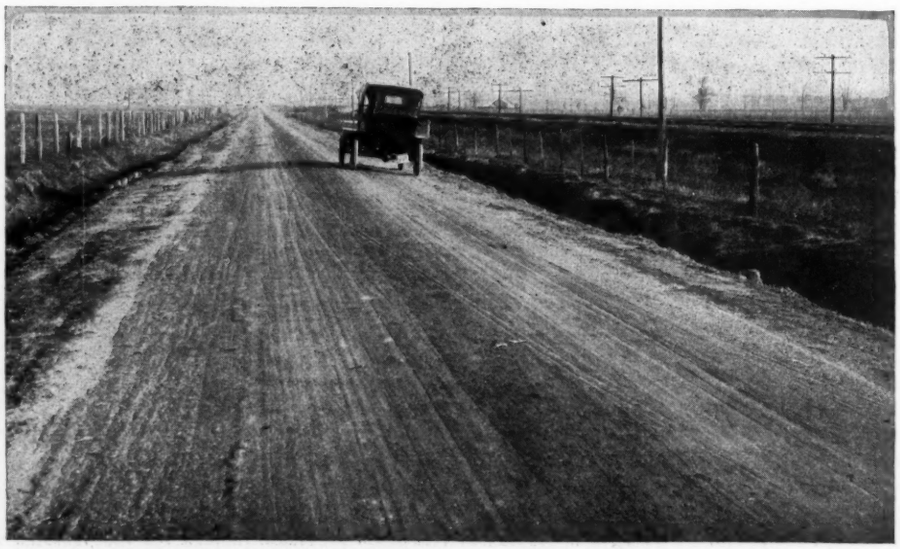
At the end of the 5 years another trade census and map was worked out in the same way. To the gratification of the merchants it was found that more than 2,200 people resided in the new territory added to the trade district by 365-day roads. Thus roads had added more buying power than all the factory bonuses the town ever had given, and Clarkson row is rented. More than that, the town boasts that it has not a vacant dwelling or store building, and when the next census is announced it does not expect to have to explain the figures. It is said they will be about 2,000 greater than in 1910.

That is the community plan of doing it. If a section is ripe for a bond issue to build roads, that method will be featured, but with a muffler on the million dollar sound.

"We have scared the public in the Middle West by talking in millions when we speak of roads," Mr. Clarkson said, "rather than telling the farmer his cost will be only a 2-cent stamp a year for each front foot of his farm, or will total a 4-year-old mare for each 80 acres of land he owns. He comprehends the language of the 4-year-old mare and he can also understand it when you tell him the road really costs him nothing for he can get along with one less horse with a good road, and save the feed besides."

Great Road Already Mapped

With these methods, and others fully as picturesque, the "Jefferson Highway Man" hopes to direct the building of a great north and south road. It is mapped now from Winnipeg through Minneapolis, St. Paul, Des Moines, Kansas City, Joplin, Muskogee, Denison, Shreveport, Alexandria on into New Orleans. It goes from "pines to palms through the Food Basket of the Nation" and has been called "the Vacation Highway of America," because it



A shell road—part of the highway in Louisiana

opens a new game region and lake region at the north, pierces the Ozarks with its bass streams and summer resorts and the "Shepherd of the Hills" country at the center, and ends at the south in New Orleans, the winter Mecca. It intersects the National Old Trails road at Kansas City and the Lincoln highway at Des Moines. It runs with the new canal-wise north and south freight movement.

Only a small part of it is hard-surfaced at present, but it is asserted there is not a mile of the dirt part that is not kept dragged and that does not have a hopeful sentiment for permanent improvement.

That the Texas division of the Jefferson highway will measure up to the full standard, which calls for hard-surfaced roads between Winnipeg and New Orleans and fixes 1919 as the time limit for all states to meet this requirement, is evidenced by the road improvement now under way in Texas. Entering the state at Denison the Jefferson highway passes through ten counties. The principal points on the adopted route are Denison, Sherman, Whiteright, Trenton, Leonard, Celeste, Greenville, Campbell, Cumby, Sulphur Springs, Mt. Vernon, Mt. Pleasant, Pittsburg, Gilmer, Longview and Marshall.

In Texas between Red River and the Louisiana state line, a distance of approximately 220 miles, about 159 miles of good roads already have been constructed or are being built by bond issues, and road bond issues are being considered to build the remaining 61 miles. In Grayson, Hunt, Hopkins, Titus, Camp, Gregg and Harrison counties bonds voted to date total $3,515,000.

The people in Texas are alive to the advantages of hard-surfaced roads and are assisted in the building of permanent highways by liberal road laws, which permit counties to issue bonds to improve highways and also allows a community to carve out a district in the county and vote bonds to improve roads in that district.

Routes and Touring Information

Harper, Kan.-Tampa, Fla.

HARPER, Kan.—Editor Motor Age—Kindly give me the best routing from Harper, Kan., to Tampa, Fla. I wish to go direct, avoiding the mountains, and also plan to miss as much of wet weather as possible.—F. N. Coulson.

In going from Harper, Kan., to Tampa, Fla., we advise that you go into Kansas City, then to Marshall, Columbia, St. Louis, Salem, Vincennes, French Lick Springs, Louisville. Then from Louisville the direct routing is by way of Mammoth Cave, Nashville, Chattanooga, Atlanta, Macon, Oglethorpe, Thomasville, Madison, Live Oak, Lake City, High Springs, Gainesville, Ocala and Tampa.

Of course, if you do not wish to go over the mountains this way, a much longer routing is to go from Vincennes to Cincinnati, Columbus, Wheeling, Uniontown, Cumberland, Hagerstown, Staunton, Roanoke, Winston-Salem, Charlotte, Greenville, Athens, then to Macon. But even this way you will get some mountains and the routing going through the eastern part of the country is so much longer that you will not find it practical.

If you do not wish to go from St. Louis to Louisville, you will find a fairly good road going from St. Louis to Murfreesboro, Cairo and Paducah, then into Nashville.

Volumes 5 and 6 of the Automobile Blue Book will give you complete running directions for this trip.

Bellefontaine, O.-Pittsburgh, Pa.

Bellefontaine, O.—Editor Motor Age—Kindly give me the best route from Bellefontaine, O., to Pittsburgh, Pa.—Alfred Butler.

In going from Bellefontaine to Pittsburgh we advise that you go to Marysville, Dublin, Columbus, Newark, Zanesville, Cambridge, Washington, Elizabethtown, Morristown, Wheeling, West Alexander, Washington, Bridgeville, to Pittsburgh.

Volume 4 of the Automobile Blue Book will give you complete running directions for this trip.

Hot Springs, Ark.—Detroit, Mich.

Hot Springs, Ark.—Editor Motor Age—Kindly give me the best route from Hot Springs, Ark., to Detroit, Mich.—Gus A. Kelpe.

In going from Hot Springs, Ark., to Detroit, Mich., the best routing for you to follow will be to go to Little Rock, Lonoke, Clarendon, Forrest City, Harrisburg, Jonesboro, Marmaduke, Rector, St. Francis, Dexter, Bloomfield, Cape Girardeau, Jackson, Perryville, Ste. Genevieve, De Soto, St. Louis, Collinsville, Edwardsville, Staunton, Litchfield, Hillsboro, Pane, Shelbyville, Mattoon, Charleston, Paris, Rockville, Crawfordsville, LaFayette, Delphi, Logansport, Peru, Wabash, Huntington, Fort Wayne, Hicksville, Bryan, Wauseon, Adrian, Clinton, Saline, Ypsilanti, Wayne into Detroit.

Volumes 5 and 4 of the Automobile Blue Book will give you complete routing for this trip.

North Redwood, Minn.-Clarissa, Minn.

North Redwood, Minn.—Editor Motor Age—Kindly give me the best route from North Redwood, Minn., to Clarissa, Minn., also from North Redwood to Troy, S. Dak.—B. H. Kuenzle.

Advise going north to Olivia, Willmar, Spicer, New London, Hawick, Lintonville, Springhill, Meiregrove, Sauk Center, West Union, Long Prairie, Clarissa.

Going from Redwood to Troy, S. Dak., go to Olivia, then follow the Yellowstone trail to Minnesota Falls, Montevideo, Appleton, Ortonville, Milbank, Twin Brooks, then to Troy.

Mt. Sterling, Ill.—Corydon, Ia.

Kindly give me the best route from Mt. Sterling, Ill., to Corydon, Ia.—Earl Bennett.

Advise that you go to Camp Point, Fowler, Ursa, Lima, Hamilton, Keokuk, Donnellson, Farmington, Mt. Sterling, Milton, Pulaski, West Grove, Moulton, Centerville, Promise, to Corydon. Complete running directions can be found in the Automobile Blue Book, volume 4.

Detroit, Mich.-Muskogee, Okla.

Muskogee, Okla.—Editor Motor Age—Kindly give me the best route from Detroit to Muskogee, via Chicago and St. Louis, outlining also some of the principal points of interest.—Harry Canup.

In going from Detroit to Muskogee, Okla., we advise that you go to Ysilanti, Saline, Jonesville, Coldwater, Howe, Elkhart, Mishawaka, South Bend, LaPorte, Valparaiso, Hobart, Highland, Hammond, to Chicago. From Chicago go to Joliet, Morris, Dwight, Pontiac, Lexington, Bloomington, Williamsville, Springfield, Virden, Girard, Carlinville, Medora, North Alton, Alton, Oldenburg, Nameoki, Madison, Venice, crossing the Mississippi river into St. Louis.

From St. Louis go to Wentzville, Warrenton, Columbia, New Franklin, Boonville, Marshall, Lexington, Independence, Kansas City, Olathe, Ottawa, Garnett, Iola, Chanute, Morehead, Cherryvale, Delaware, Nowata, Claremore, Waggoner, to Muskogee.

Volume 4 of the Automobile Blue Book will give you complete running directions to St. Louis, and volume 5 from there to Cherryvale. It also will give map and detailed entries into all towns you go through.

Sweetwater, Tex.-Lewistown, Mont.

Kindly give me the best route from Sweetwater, Tex., to Lewistown, Mont. Also route from Kansas City, Mo., to Billings, Mont., by way of Denver.—S. Hamilton.

The best and most direct way is through Denver and Billings, and for this route advise you going to Snyder, Post City, Lubbock, Plainview, Amarillo, Dalhart, Ranton, Trinidad, Walsenburg, Pueblo, Colorado Springs, Denver, Cheyenne, Wheatland, Douglas, Casper, Power River, Lost Cabin, Thermopolis, Worland, Cody, Bridger, Billings. Then from Billings you go north to Roundup, Tyler, Forest Grove, Lewistown.

Your best routing via Kansas City would be to go to Wichita Falls, Anadarko, El Reno, Poncreek, Caldwell, Wellington, Wichita, Newton, Florence, Emporia, Ottawa, Olathe, Kansas City. Then from Kansas City there are several options. You can go straight from Kansas City to Topeka, Manhattan, Colby and Limon to Denver, or go to Omaha and follow the Lincoln highway to Cheyenne, and then go north as given above, or you can go from Omaha to Sioux City, Sioux Falls, Brookings, Ortonville, picking up the Yellowstone trail at Ortonville over to Billings.

All of these different directions are contained in volume 5 of the Automobile Blue Book.

Memphis, Tenn.-Magnolia, Miss.

Memphis, Tenn.—Editor Motor Age—Kindly give me the best route from Memphis, Tenn., to Magnolia, Miss.—L. U. Pitts.

For your trip to Magnolia suggest going south to Wells, Lake Cormorant, Tunica, Clayton, Dundee, Rich, Clover Hill, Tutweiler, Sumner, Glendora, Schlater, Greenwood, Lexington, Goodman, Canton, Jackson, Terry, Crystal Springs, Hazlehurst, Wesson, Brookhaven, Summit, to Magnolia.

Mercer, Pa.-New Haven, Conn.

Mercer, Pa.—Editor Motor Age—Kindly give me the best route from Mercer, Pa., to New Haven, Conn., also the distance.—J. M. Van Horn.

In going from Mercer to New Haven, we advise that you go north to Youngsville, Warren, Bradford, Smethport, Coudersport, Wellsboro, Elmira, Waverly, Owego, Binghamton, Bainbridge, Unadilla, Oneonta, Stanford, Grand Gorge, Margaretville, Shandaken, Phoenicia, Kingston, Poughkeepsie, Pawling, Brewster, Danbury, Bridgeport, then to New Haven.

Volume 1 of the Automobile Blue Book will give you complete routing for this trip. The distance is about 600 miles.

Chariton, Ia.-Fort Morgan, Colo.

Cambria, Ia.—Editor Motor Age—Kindly give me the best route from Chariton, Ia., to Fort Morgan, Colo., and the distance.—Roscoe C. Morgan.

The best route is to go to Osceola, Talmadge, Creston, Brooks, Stanton, Red Oak, Emerson, Hastings, Glenwood, Council Bluffs, Omaha, Fremont, Schuyler, Columbus, Silver Creek, Central City, Grand Island, Kearney, Lexington, North Platte, Big Springs, Julesburg, Sterling, into Fort Morgan. Distance, 690 miles.

Volume 5 of the Automobile Blue Book will give you complete routing for this trip.

The Readers' Clearing House

SETTING STROMBERG CARBURETER

Adjustment Explained for Device on Chalmers 6-30

PERRY, Ia.—Editor Motor Age—Kindly advise how to set Schebler carbureter as used on the Chalmers 6-30?

2—Can a cutout be installed on the Chalmers 6-30? If so, where can I obtain one?

3—What is the weight of the model 6-30?—Harry E. Ellett.

1—There are but two adjustments on this Stromberg carbureter. See Fig. 2. The main adjustment controls the gasoline supply from the float chamber, and regulates the mixture through the whole driving range. Turning nut A clockwise, or to the right, raises the needle and gives more gas; counter-clockwise, less. If an entirely new adjustment is necessary, turn nut A until the top of the needle E is flush with the top of the cap marked high speed; then add about 16 notches to the right, or clockwise, which should give a mixture somewhat rich. After starting and warming up the motor, this adjustment may be altered as necessary for the best driving mixture. The gasoline for idle is taken in above the throttle and controlled by dilution with air from the inside of the carbureter, as regulated by screw B, which should be approximately one complete turn to the left, or counter-clockwise, for the seating position. After the motor is warm this may be regulated as necessary, turning to the right for less gas and to the left when more gas is required. The idle adjustment is effective only when the throttle is closed.

2—Most any motor car supply house can furnish a cutout that is applicable to this car. Scan the ads in the clearing house section of this issue.

3—The weight of the touring car is 2,630 pounds, fully equipped.

SPEED WITH AN OLDS ARISTOCRAT

Reduction of Weight on Higher Gearing For Desired Results

Louisville, Colo.—Editor Motor Age—I would like very much to have Motor Age's aid in helping me build a racing car out of an Oldsmobile Aristocrat model 28, a seven-passenger touring car with 39 by 5 tires.

1—What carbureter should I use, and is it advisable to use a vacuum feed for racing?

2—This car weighs about 4,400 pounds and can make 58 miles per hour at the present time. I want to know what weight would be the most practical and to best advantage for cross-country runs.

3—What is the gear ratio of this model, and how high would or should it be geared for 90 to 95 miles per hour?

4—Would there be any advantage in changing the wheels to a smaller size?

5—Any suggestion would be greatly appreciated that will help in making this a speedy car. —J. A. Girard.

1—There are a great many good carbureters obtainable. Get a modern one that is designed to take care of the low-grade fuel which is now on the market. A vacuum tank would prove satisfactory if properly installed.

2—The lightest weight possible without removing or cutting down any parts of the car which are needed to maintain strength. Lightening the weight will increase tire mileage and mileage per gallon of gasoline.

3—The stock gearing is 3.75 to 1 on direct. A 3 to 1 gearing, if obtainable, would give you more speed, and if you stripped the car and reduced the weight considerably the motor would undoubtedly handle this ratio. We do not think this car could be made to go 95 miles per hour.

4—No.

5—If the car will make 58 miles per hour now, reduction of the weight by removing the body and applying bucket seats and possibly installing a higher gear ratio would give you all the additional speed you could use. The only place you could safely drive a car 90 miles per hour would be on a race course, and even under those conditions such speed should be left for professionals.

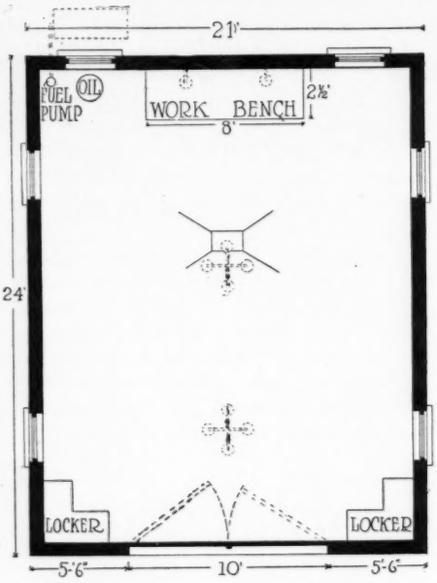


Fig. 1—Suggestion for private garage 21 by 24 feet for one car

Speeds of Two 1916 Sixes

Sanford, Fla.—Editor Motor Age—How fast will the Buick Big Six travel?

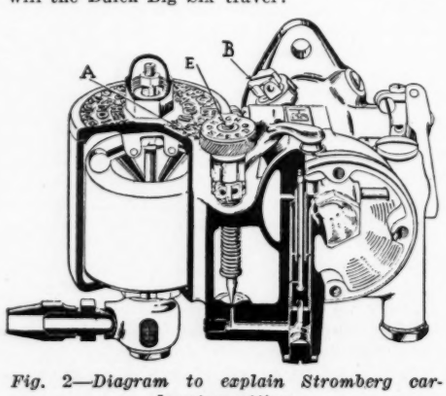


Fig. 2—Diagram to explain Stromberg carbureter setting

2—What is the fastest official record ever made by this car with top down and windshield folded?

3—Does the Buick company guarantee these cars to make 72 miles per hour?

4—Will the six-cylinder Overland make 72 miles per hour?—Irl Nelson.

1—The factory rates the speed at 60 miles per hour.

2—To our knowledge no such test has ever been made.

3—Not to our knowledge.

4—The stock car will not.

WHY AIR IS CHOKED BY VALVE

Must Be Regulated to Insure Proper Mixture of Gases

Elwin, Ill.—Editor Motor Age.—Why is it that most carbureters are choked to control the fuel instead of controlling the fuel direct. When the butterfly is closed or partly closed it makes the engine draw hard to get the air, and does it not cut down the compression in the cylinders? Why not have the engine get air freely at all speeds and give less gas when one wants to cut down speed and have a lean mixture with a full charge of air.

2—Explain why a vibrator or circuit breaker is necessary.—E. S. Waggoner.

1—The compression is not reduced by the action of the air valve. The air is necessarily choked to maintain a uniform mixture between the gasoline vapor and air. A full charge of air, that is, all the air that would be drawn into the motor by suction from the decending piston, would be far too great and the only thing to do is to provide some means to reduce this air supply. It is a case of filling the cylinder with the proper mixture of gasoline and air, not filling it with air.

2—The electrical circuit to the plugs must necessarily be closed only at the moment when the gasoline is to be fired. If there were a continual spark through the plug the gas would start burning the moment that the intake valve opened.

MICA DEPOSITS ON ARMATURE

Caused by Arc of Current From Rough Spots on Brushes

Fremont, O.—Editor Motor Age—I have a Buick C-37, Delco System, which I have driven for a little over a year. Have never used the dry cells until about 2 weeks ago. On leaving church one Sunday I happened to pull out the B button instead of the M button and did not discover my mistake until I reached home, about a mile. I ran between 10 and 15 miles per hour. Did this do any harm?

2—The button on my rotor burns a black substance on it; also the points on distributor. This can be removed by rubbing it with vaseline, but after running car a few miles this carbon-like substance is burned on again. What is the cause and remedy?

3—In case a ground should develop in wiring to horn where it goes through the tube and steering wheel housing like on my Buick, what would be the quickest way to overcome this, say it was raining hard and you had no rain coat with you?—A. J. Gustason.

1—There was no harm done. The batteries are there for use.

2—The black substance is what is known as high mica. This will always appear to some extent and must necessarily be cleaned off. If the trouble appears frequently, as in your case, the brushes are not shaped to conform exactly with the

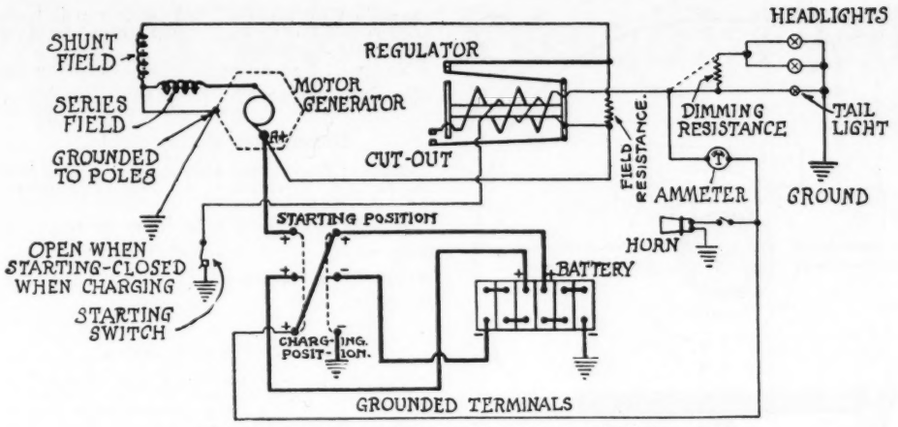


Fig. 3—Schematic wiring diagram of Simms-Huff system

commutator. That is, there are rough spots which create a space between the brushes and armature. The electric current arcs through these spaces causing the mica deposits. The remedy is to have the brushes seat firmly throughout their surfaces. Try slipping a strip of emery paper between the brushes and the armature and, with motor running, pull the emery paper gently back and forth. This might make a smooth seat. Possibly the brushes are worn out and need replacing.

3—Disconnect the wire leading from the battery to the horn switch.

SIMMS-HUFF GENERATOR TESTING

Method Explained and Schematic Wiring Diagram Illustrated

Woodward, Okla.—Editor Motor Age—Please publish a way to test a Simms-Huff generator to see if it is generating any current. Please show how to test with test points.—Ray Boswell.

A schematic wiring diagram of the Simms-Huff system will be found in Fig. 3. To test the system as a generator, the test lamp or volt meter is connected from the positive brush holder terminal, or main terminal, to the frame. With the engine running at about 600 revolutions per minute the meter should read 7 volts or more, or with a test lamp, the lamp should light up. If the system still does not show it is operating, connect from the main terminal to the shunt-field terminal on the side, thus cutting out the wiring to the regulator. If current then shows on the testing instrument, the trouble is evidently in the wiring or in the regulator-cutout. Otherwise, examine the brush holder to see that it is not short-circuited and that the commutator is smooth and free from oil or dirt and the driving belt is not slipping.

AS HE THINKS CAR SHOULD BE

Delage Type Radiator and Fenders Without Running Boards

Phoenix, Ariz. — Editor Motor Age. — Having noticed with interest in the Reader's Clearing House of Motor Age, several illustrations of cars designed along the contributor's own lines, I am enclosing a drawing of my idea of a car worth while, a description of which follows:

The radiator is of the same style as the one used on the Delage car at Indianapolis in 1914. The hood and cowl slope very slightly, and the wind shield is slanting, as you will see. The seats are of the individual type, placed nearly on the floor and slanted to a comfortable position. The gear shift is of the common H type and, with the emergency brake lever, is on the right-hand side, within easy reach of the driver. The fenders, which are merely mud guards, are fastened to the axles instead of the frame. The springs, semi-elliptic, front and rear, are shackled on the rear ends. Hartford shock absorbers and wire wheels with 33-inch by 4-inch tires all around are used.

The cowl, as you will notice, is ventilated near the bottom. The short running board is hung from the frame with the conventional hangers. There are four doors, each 20 inches wide and operating on concealed hinges. The gasoline is in a tank suspended from the rear of the frame and is fed by the vacuum system. The front and rear seats are of the same width, being intended to seat two people each, comfortably. Plenty of leg room is provided. The wheelbase is 130 inches. In the cowl dash are small lockers and in the front doors are compartments for tools and accessories. Back of the rear seat is a space into which a suit case fits and which opens at the top with a combination lock. Below this is the oil. Spare wheels are carried on irons attached to the frame. There is room under the rear seats for curtains, etc. The storage battery is under the front floor board. A three-speed transmission and Hotchkiss drive is used. The brakes are of the internal expanding type and are contained in 16-inch drums. A high-speed engine, with a gear ratio of three to one on direct drive being on third. The horn is mounted on the right side on the cowl just in front of the door and above the cowl vents. The upholstering is deep and of leather covered with mohair seat covers. I think this car is equally as practical and comfortable as it is good looking. —Ralph S. Daklin.

BRAKING WITH CLUTCH ENGAGED

No Gasoline Saved by Shutting Off Spark and Coasting

Warren, Pa.—Editor Motor Age—Your argument regarding "Braking with clutch engaged," has greatly interested me.

1—We will take it for granted that any car nowadays with properly adjusted brakes will generate enough friction to hold it back on a hill, but I have always thought that by leaving the car in gear one would save the brakes and thus not have to have them relined so often. Relining brakes is a small matter financially compared to wear on universals and motor bearings, so is it economical to use the motor for a brake on long descents? Is it not true that the motor will consume as much gasoline if it is turning over whether or not the switch is on or off?

2—In some cases I have had to put the motor in low speed and then use both the brakes, but, of course, this was an exceptionally steep hill. I also have coasted down hills with the car in gear and the switch off and the throttle open to cool off the motor. Did this save gasoline?

3—Also is it not true that when one relies on the brakes alone, he will permit the car to gain momentum and then apply the brakes a little sharper than usual and skid? And often one wheel will take hold sharper than the other, whereas if you were using compression, both would be equal?

4—I would like to ask about the ten valve Peugeot that you speak of in the discussion of aluminum castings in the July 27th issue.—N. C. Ensworth.

1—Braking with the motor alone is not going to do any harm. Applying the brakes with the clutch engaged, that is, using the motor compression and brakes in combination, places an undue strain in the working parts. If the motor alone will hold you back on long descents, all well and good. Gasoline mixture will go through the valves whether the spark plugs are in action or not.

2—If your brakes were in proper condition this would not be necessary. They should slide the wheels, and a combination of motor braking and brake-band braking can do nothing more. There was surely no gasoline saved in the proceeding you describe. With the throttle open wide there was enough gasoline being used to drive your motor at full speed.

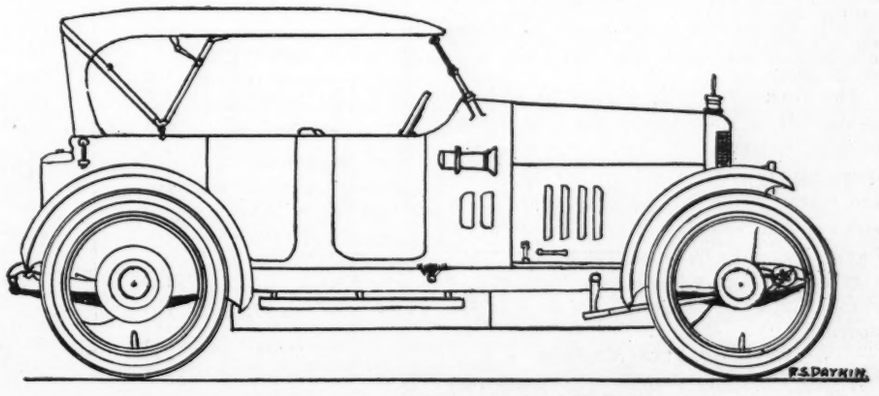


Fig. 4—Car combining ideas of reader

3—This is also entirely a matter of adjustment. You should be able to apply your brakes with any degree of tension. A slight pressure, maintained, should keep up an even, easy friction. The brakes should be so adjusted that they will give even pressure to both rear wheels. In decending mountains, where there is an unusual number of steep grades to be encountered, it is sometimes advisable and even necessary to use the motor with the clutch to save the trouble of replacing worn-out brake linings.

4—This was a typographical error. The motor referred to is an eight-valve.

GETTING JOB AS RACE MECHANIC
Experience Is Necessary Before One Can Qualify for Racing

Oak Park, Ill.—Editor Motor Age—Can you give me any information as to the best way to enter the racing game as mechanician? I have been driving and repairing for the past 6 years and am anxious to get into the racing game, but do not know just how to go about it, as I have not seen anything in Motor Age regarding this. I would also like to know what the A. A. A. examination consists of; that is, for driver and mechanic.—B. Smith.

Attend the next race, if possible. Try to talk with some of the drivers and state your wishes to them. If you were willing to join a racing camp as a repairman at a small salary you could possibly get an opportunity to try your hand as a mechanic. It is a proposition of working up and doing a lot of learning. Write an application to each manufacturer who is campaigning racing cars. Registration is granted to drivers and mechanics by the American Automobile Association when that body is convinced that the applicant is sufficiently experienced to be allowed to compete in motor car races. No one under 21 years of age is considered. Present an application to the association with a list of references and a summary of your experiences and a license might be granted you. The possession of this license would be of assistance in getting a job as a mechanic.

REASON FOR ORDER OF FIRING
Why Four-Cylinder Motors are Balanced End for End

Kittanning, Pa.—Editor Motor Age—Will you kindly tell me why all four-cylinder engine crankshafts are made so that when No. 1 and 4 pistons are on the up stroke, No. 2 and 3 pistons are on the down stroke? Would it not give a better center balance to the crankshaft if when No. 1 is on the up stroke No. 4 would be on the down stroke and No. 3 on the up stroke? I know that No. 1 and No. 2 piston balance each other so does 3 and 4, but No. 1 and 2 do not balance No. 3 and 4 on the center bearing causing the crankshaft to whip at the center bearing. I have no doubt but that the engineers have good reason for making the crankshaft the way they do, but I would like to know very much what the reason is.—W. F. Tittle.

The reason for it is exactly as you describe. It is undoubtedly the best design to give balance. If. No. 4 were on the down stroke with No. 1 on the up stroke the motor would be out of balance from end to end and this is compensated by having the outside and inside pistons work together. Whip is taken care of by proper crankshaft balancing or by use of a center bearing.

Charging Ford Magneto

Fenton, Ia.—Editor Motor Age—Some time ago there was an item in Motor Age on how to charge a Ford magneto. I have lost that issue and would like to have you send me another one.—Otto Borchardt.

You will find an article on the charging of a Ford magneto on page 47 of this issue.

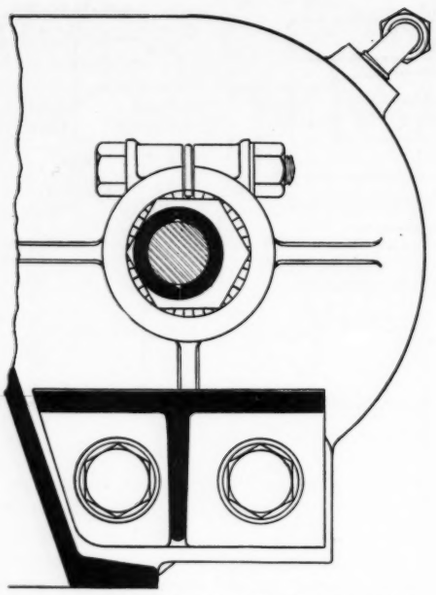


Fig. 5—Camshaft chain adjustment on Velie

Inquiries Received and Communications Answered.

Harry E. Ellett.....Perry, Ia.
A. J. Gustason.....Fremont, O.
J. A. Girard.....Louisville, Colo.
E. S. Waggoner.....Elwin, Ill.
Ray Boswell.....Woodward, Okla.
Ralph S. Dakin.....Phoenix, Ariz.
N. C. Ensworth.....Warren, Pa.
B. Smith.....Oak Park, Ill.
W. F. Tittle.....Kittanning, Pa.
O. A. Ward.....Quincy, Ill.
Joseph P. Evan.....Dubuque, Ia.
Harry Kramer.....Knox, Ind.
F. C. Myers.....Bucyrus, O.
Otto Borchardt.....Fenton, Ia.

No communications not signed by the inquirer's full name and address will be answered in this department.

Horsepower Rating Table

Quincy, Ill.—Editor Motor Age—Kindly give the A. L. A. M. rating of all sizes of cylinders. —O. A. Ward.

We are publishing a table on these pages from which you can obtain the N. A. C. C. rating of all sizes of cylinders from 2½ to 6-inch bore.

Building Private Garage

Dubuque, Ia.—Editor Motor Age—The writer is building a private garage the size of which is to be 21 by 24. Can you give me some idea or sketches on garages and what the proper way would be to lay it out?—Joseph P. Evan.

Illustrated in Fig. 1 is a plan of a garage of the size you specify. It affords plenty of sunlight on all sides of the car for repair work and locates the fuel supply tanks and the work bench in accessible places. For further information on garages we refer you to E. J. G. Phillips' article in a coming issue.

Camshaft Chain Adjustment

Knox, Ind.—Editor Motor Age—I have a Velie, model 11, 1914, on which the chain which drives the camshaft and the magneto shaft is loose and noisy. Kindly advise me if there is any way to tighten this and get rid of the noise. —Harry Kramer.

You will find illustrated in Fig. 5 a section through the magneto bracket, as arranged on the Velie model 11. The sprocket is retained by a lock washer and bolt. By removing these and by loosening up the two bolts which support the magneto bracket, the eccentric bushing can be revolved, increasing or decreasing the tension in the driving-chain.

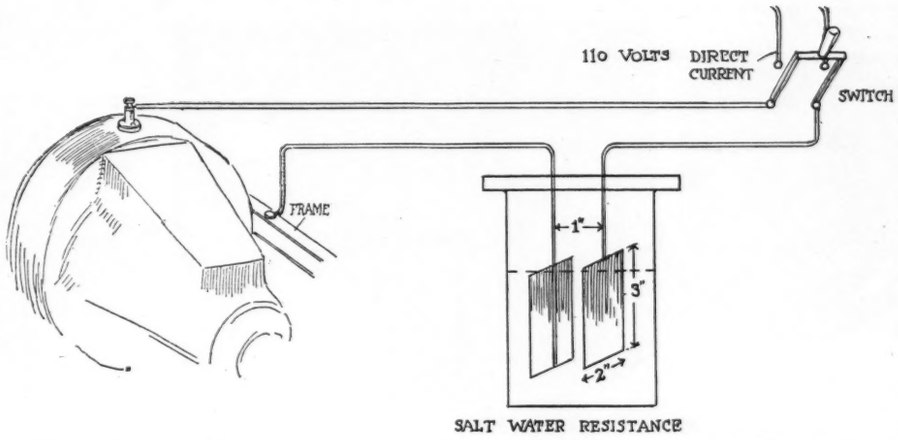
Horsepower Table by N. A. C. C.—Formerly A. L. A. M. Formula; Also Known as S. A. E.

In using table, find bore of cylinder in inches or millimeters in the proper left hand column, then read across to right under column for the number of cylinders that the motor under consideration has.

BORE = D		NUMBER OF CYLINDERS = N			
Inches	Millimeters	4	6	8	12
2½	64	10.00	15.00	20.00	30.00
2⅝	68	11.03	16.54	22.05	33.08
2¾	70	12.10	18.15	24.20	36.30
2⅞	73	13.23	19.84	26.45	39.68
3	76	14.40	21.60	28.80	43.20
3⅛	79	15.63	23.44	31.25	46.88
3¼	83	16.90	25.35	33.80	50.70
3⅜	85	18.23	27.34	36.45	54.68
3½	89	19.60	29.40	39.20	58.80
3⅝	92	21.03	31.54	42.05	63.08
3¾	95	22.50	33.75	45.00	67.50
3⅞	99	24.03	36.04	48.05	72.08
4	102	25.60	38.40	51.20	76.80
4⅛	105	27.23	40.84	54.45	81.68
4¼	108	28.90	43.35	57.80	86.70
4⅜	111	30.63	45.94	61.25	91.88
4½	114	32.40	48.60	64.80	97.20
4⅝	118	34.23	51.34	68.45	102.68
4¾	121	36.10	54.15	72.20	108.30
4⅞	124	38.03	57.04	76.05	114.08
5	127	40.00	60.00	80.00	120.00
5⅛	130	42.03	63.04	84.05	126.08
5¼	133	44.10	66.15	88.20	132.30
5⅜	137	46.23	69.34	92.45	138.68
5½	140	48.40	72.60	96.80	145.20
5⅝	143	50.63	75.94	101.25	151.88
5¾	146	52.90	79.35	105.80	158.70
5⅞	149	55.23	82.84	110.45	165.68
6	152	57.60	86.40	115.20	172.80

The Motor Car Repair Shop

IN the repair shop department of the June 8 issue of Motor Age was published an article by Victor Des Roches on recharging Ford magnetos. Since that time a large number of letters have been received asking for the exact proportion of salt and water solution to be used in connection with the lighting current methods. Several readers have also written in that they could not perform the work themselves because they had no magnetometer for determining whether or not the magneto is fully charged. Some others who have experimented have overcharged the magnets by not knowing the length of time that the current should be directed into them. The questions all applied to the method of charging from a 110-volt lighting system.



Wiring arrangement to charge Ford magneto from 110-volt direct current lighting cricuit

For those who do not have a copy of the June 8 issue available, the recharging method utilizes a 110-volt circuit which is passed through a solution of salt and water. Thence the current is conducted to the ignition terminal on top of the magneto case and is returned through a wire grounded to any part of the frame.

The salt water resistance is used simply to prevent a direct short circuit on the mains of the lighting circuit and it does not make possible charging from alternating current lines.

Salt Solution Formula

Using any kind of metal plates, 2 by 3 inches, and suspending them in a parallel position about 1-inch apart from the wooden stick, as shown in the diagram, and a salt solution of 4 ounces of salt to 1 gallon of water, about 75 amperes of current will flow through the windings of the magneto from a 110-volt lighting circuit.

The heavy current should be taken at the mains behind the fuses. The current should be applied only for a fraction of a second, as it takes only a few hundredths of a second to charge the magneto completely. To get good results one must have a strong current and it does absolutely no good, but a great deal of harm, to leave the current on more than a second. If longer, all the excess current simply heats up the windings, the degree of heat depending on how long the current is left on, and the windings may be burned.

If one should not obtain a good magneto charge by this method, either one of two things is at fault—not stopping the magneto at the correct place, or not using strong enough current. If one has tried to remagnetize with alternating current, every trace of charge is liable to disappear due to the reversals of the alternating current. The current to use is direct current, namely, current from batteries, or a generator with commutator and brushes or a direct power circuit, and it must be of great strength.

In order to know whether or not a good charge has been obtained without the use of a Hoyt magnetometer, one is left to his judgment, by noting the increase in brilliancy of the headlight lamps before and after the charge with the engine running at the same speed; or, if possible, comparing the brilliancy with that on a brand new car, of course, running the engine at the same speed. By more expensive instruments than the Hoyt meter, such as a good alternating current voltmeter of 30 volts capacity, a well-charged old style magneto will show about 18 volts at highest engine speeds and a new type magneto will show about 27 volts at the same high speeds. This is, of course, to be tested with no other wires connected to the magneto except the meter wires. When the lights are on and the ignition also, these values are reduced.

It is advisable to use new lamps when comparing different cars, because old lamps do not give the light that fresh ones do.

Some Common Magneto Troubles

In some makes of magnetos the distributor cover is held in place by clamps of some sort, in other words a flexible contact is made as against a rigid fastening used on other makes. In such instruments the distributor cover may wabble a little after the magneto has been in use some time with the result that the motor may misfire, and in one case reported recently the motor refused to operate.

Should one have a car equipped with such a magneto he should examine the distributor cover occasionally to note if an undue amount of play is present. The cover may be held more firmly if the metal clamps are sprung a little or if a piece of thick paper or cloth is inserted between the clamp and the sides of the cover.

Loose wires are always a cause of much annoyance. The magneto wires, which fit into the distributor, become so loose, sometimes, that they jump out of place. In such instances an adjustment may be provided at the wire's end. Where no adjustment is possible a few turns of small diameter copper wire wound around the end of the lead usually holds the terminal secure.

Another method, and one often used by drivers of racing cars, is to place all the wires in a conduit and then fasten the conduit securely to some part of the motor, in three or four different places.

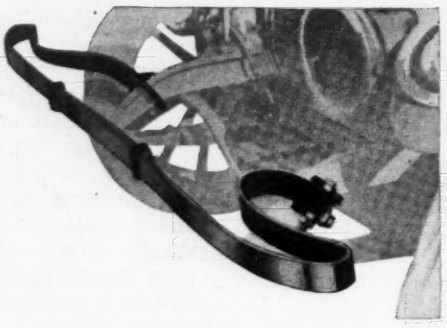
A want-to-do-my-own-repairing owner was assembling a few motor parts and when he came to the magneto found that the shim from the base was missing. He promptly cut one out of fiber and replaced the magneto only to find that the motor would not operate when assembled. This owner forgot the fact that a metal shim was used to line up the magneto, and that the ground connection was through the base of the instrument.

Fastens the Dry Cells Down

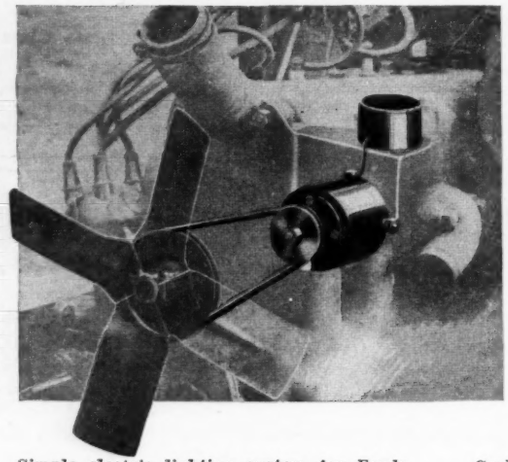
In a car which utilizes dry cells for ignition purposes, either in an emergency or normally, it is not a good idea to place them loosely in their appointed place. Most cars using them are fitted with some form of holding device to prevent their slipping and bumping together. Short circuiting of the wires, rubbing off of the paper containers so that the zinc sides are in contact and damage through other similar causes are the results of carelessness in this matter.

If the car is not regularly supplied with some form of holder, it is best to take a piece of wood, bore holes large enough to receive the cells, and fasten this to the corner of the seat compartment or other space where the cells are carried. It does not take much time to do this, and it is a noteworthy precautionary measure in preventing future trouble.

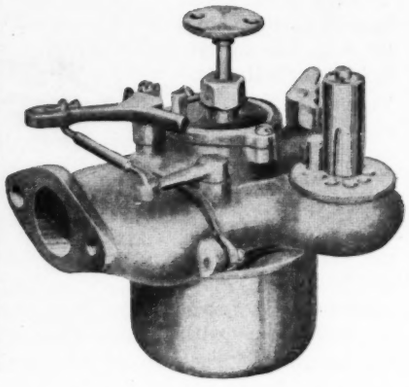
The Accessory Corner



Spring-steel bumper of universal design



Simple electric lighting system for Fords

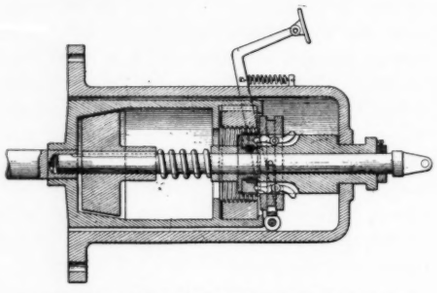


Carbureter in which air is fed above butterfly

AN invention of interest is that of a combination electric meter and fluid gauge. The object of this invention is to provide in connection with a voltmeter or ammeter an indicating mechanism which also denotes the height of liquid in a tank although the gauge itself is some distance from the tank. The arrangement is such that when one button is pressed the electric current is indicated and when another is pressed the height of the liquid in a gasoline container is shown. These separate indicating means can be adapted to be located at different points if desired, such as in the rear of the car, at the tank or on the dash. The method of carrying out this invention which is the subject of a patent issued to Alfred and Carl and Reinold Fehrenbach, is shown in the accompanying illustration. The device consists of a rheostat so arranged that it is in connection with the battery and a volt or ammeter. The rheostat is provided with an arm which travels over the contact of the rheostat and cuts out or cuts in resistance in accordance with the direction in which the shaft is rotated by the movement of the float. In other words the rise or fall of the float cuts in or cuts out the resistance and consequently the amount of current passing through the line in connection with the indicator. A suitable gauge scale is used which converts the readings from terms of current to those of gasoline quantities, thus allowing the mounting of a simple tank level gauge on the dash.

Garage Door Opener

C. V. Smock, of Portland, Ore., has invented a practical device for opening, closing and locking garage doors, and this without requiring the driver of a car to move from his seat when entering or leaving the garage. A small metallic lock box on a post rising from the ground at the side of the runway leading to the garage is the only outward sign of the garage



Positive-action clutch of unusual design

opener. As the machine approaches, the driver inserts his key in the lock box, turns it, and the door of the garage responds instantly by opening. A light in the garage is also turned on by this action. The turning of a switch inside the garage closes or opens the door as desired. The garage doors can be closed from the outside station as the machine is driving out. Another feature which completes the genuine usefulness of the invention is the automatic locking device.

Locks Vehicle in Freight Car

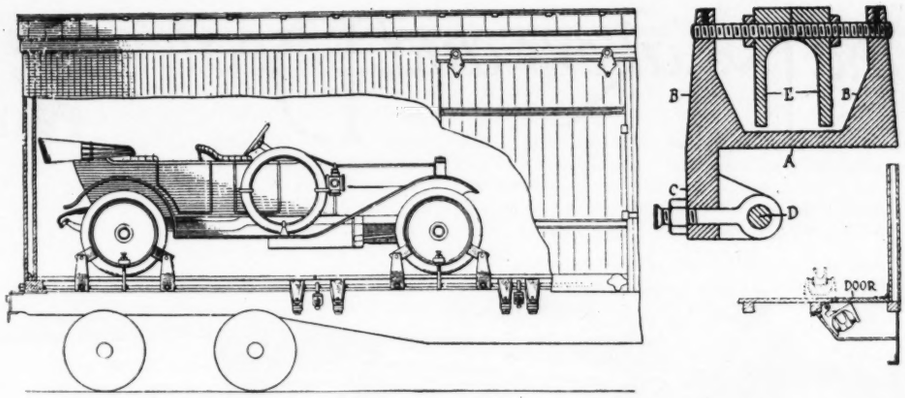
An interesting device for securing a motor car during shipment in a freight car has been invented by E. F. Martin, of New Orleans, La. The attachment is fitted in the freight car and is designed to prevent the motor car from movement either longitudinally or laterally with respect to the car and also to prevent any undue wear of the tires or dents in the rims while in transit. The mechanism is also so arranged that it can be moved out of operated position below the floor of the car to prevent interference with other freight when it is carried. The freight car is provided at each side of the floor with a longitudinally extending opening and these openings are normally closed by a series of doors which swing upward against the inner face of the side of the car or downwardly against the floor. These doors are closed under normal conditions and when they are closed the car does not differ from the ordinary freight car and may be used for other purposes than for motor cars. The supporting and clamping mechanisms for the four wheels of the vehicle are connected with a rod which is located lengthwise in the car and held in fixed position. The supporting mechanism swings about these rods and when raised into position to hold a car each one comprises a substantial U-shaped support consisting of a body A with arms and a lug C which hold the members supported to the rod D. In addition there is a U-shaped part E which swings upward and around the tire holding it firmly in position.

Sponge-Rubber Tire Filler

Many attempts have been made to devise a practical tire filler or cushioning body for casings and a number of patents have been issued covering various types. One of the most recent of these is the construction defined in patent No. 1,176,511 issued to Francis Zuber, Brooklyn, N. Y. Zuber's invention is clearly shown in detail by the accompanying illustration. The lower diagram shows the shape and the method of joining the filler blocks, which are of a soft, spongy, resilient rubber, the ends overlapping by an ample margin. The filler material is given additional resiliency by the use of air channels in each block.

Inner Armor for Tires

Insyde tyres, marketed by the American Automobile Accessories Co., 621 Main street, Cincinnati, O., are designed to relieve the outer casing of the air-pressure load, and at the same time protect the inner tube. They are made of tough fabric vulcanized over tire molds so that they will be shaped to fit exactly the inside of the casing for which they are made. This is said to prevent wrinkles which might



Device for locking motor car on floor of freight car

pinch the tube. The outside is coated with rubber, which vulcanizes itself to the inside of the casing, according to the manufacturer, and, thus, prevents slipping. The part of insyde tyres which comes in contact with the tube is coated with rubber and so treated that the tube cannot stick.

Resilient Spring Bumper

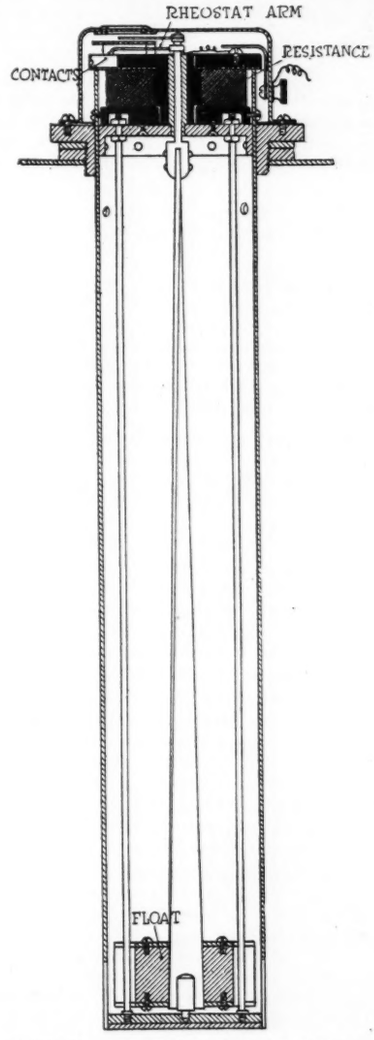
The Auto Parts Mfg. Co., Chicago, which company, incidentally, has just moved into its new factory at 313-317 Milwaukee street, announces the Badger resilient spring bumper, made to fit practically any make of car. The devise is a two-piece, spring-steel bumper, designed for indestructability. The bar is made of high-quality spring steel, specially tempered. After any reasonable shock the bar will spring back to its original position with no damage to the car or the bumper. The bar can be adjusted to any angle desired. The price with a 2-inch nickel bar is $12; or with a black bar, $10.50.

New Idea in Carbureters

The Chandler carbureter, marketed by the Chandler Sales Co., 9 S. Clinton street, Chicago, is a new idea in the principle of carburetion, namely, the admission of air above the controlling or throttle butterfly combined with the means to meter the air, thus admitting to the requirements of the motor. The adjustment of the carbureter is controlled by the throttling butterfly. On a quick acceleration a higher vacuum is thrown on the high-speed air valve as well as the gas jet and this valve admits the proper amount of air to overcome the additional gas that comes from the gas jet, said to prevent a load or choke of the motor. In like manner, in hill climbing, or under heavy loads, when the motor is pulling hard and not turning over as fast as it would with a less load and the controlling butterfly remains in the same position, the high-speed air-valve automatically admits the proper amount of air to give the most powerful, which is the most economical mixture. There is only one moving part and that part meters the air admitted to the engine. There are but two adjustments. The price, Ford size, is $15.

Electric Lighting for Fords

The Detroit Starter Co., Detroit, Mich., after a year of experimental development work, now offers for sale its lighting system for use on Ford cars. The equipment is known as genolite. It is orthodox in design, employing the conventional plan of the generator, storage battery and automatic cutout. The generator has a minimum and maximum speed of 900 and 1,800 revolutions per minute respectively. It has plain bronze bearings of generous size, self oiling, the armature mounted on a hardened and ground alloy-steel shaft. The two brushes are of copper graphite and are self-lubricating. The generator itself is mounted on a left-hand bracket, which in turn is attached to the forward cylinder of the motor. Drive is through belt and pulleys. The price is $19.85, f. o. b. Detroit.



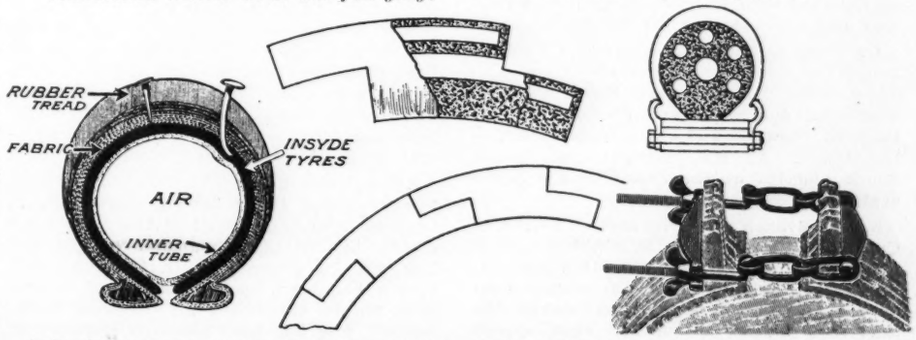
Combination electric meter and fuel gauge

Ford Gearset Band Clamp

The New York Motor Car Device Co., 200 11th avenue, New York City, is marketing a device known as the premo transmission band clamp for assistance in replacing the gearset bands in Ford cars. The bands are held firmly around the drums with the ears in position to permit of slipping the three shafts in place as the cover goes down and the clamp is then removed through the small door in the gearset case cover. This is said to eliminate the danger of injuring the felt gaskets in attempting to fit the shafts in place one at a time while pushing down the cover. The price is 50 cents.

Automatic Motor Car Clutch

Allen Conkling, 630 Marquette Bldg., Chicago, is prepared to interest builders in a recently patented clutch for use in motor cars which is radically different in design from the convention cone-clutch form. Engagement of the clutch is performed through the use of a nut and screw, and, therefore, the engagement is positive. Any lost motion or wear is taken up by the action of this nut and screw. The clutch is enclosed in a tight case and runs in oil, which both acts as a lubricant and as a cushion upon which easy engagement of the clutch depends. The cone is steel against steel, there being no facing. The nut is controlled by the foot pedal which operates the nut and throws in the screw. When the nut and screw, which is attached to the shaft, are in engagement, the cone is forced against its seat with sufficient pressure to turn the shaft, and when the shaft turns the whole mechanism revolves with it until the nut is released from the screw by the operator.



Left—Inner armor for tire protection. Center—Sponge-rubber tire filler. Right—Gearset band clamp for Fords

Among the Makers and Dealers

TRAILMOBILE FOR TELEGRAPH POLES—A novel trailer for hauling telegraph poles has been developed in Cincinnati. The illustration shows the vehicle loaded to its capacity, one of the poles being 45 feet in length. The chassis has a capacity of 2,000 pounds. The wheelbase measures 17 feet 5 inches and solid truck tires are used, the front being 2-inch and the rear 6½-inch. The frame is of steel section, measuring 19 feet 5 inches from front to rear cross-members. These vehicles are familiar sights on Cincinnati streets.

WESTERN Partin-Palmer—J. B. de Long has been appointed southern California distributor of the Partin-Palmer.

Ford Assembly Plant—The Milwaukee branch assembling plant of the Ford Motor Co. now has reached a daily production of 106 cars, and before September 1 expects to increase this number to 150.

Kent Goes to Kansas City—C. F. Kent, formerly manager of the Dallas branch of the Pennsylvania Rubber Co., has been transferred to the Kansas City branch, of which he will have charge.

Merrithew with Rayfield—H. E. Merrithew, former vice-president and general manager of the O & M Supply Co., of Kansas City, has been appointed district manager by the Findeisen & Kropf Co., manufacturers of the Rayfield carbureter.

Milburn Toledo Branch—The Milburn Wagon Co., of Toledo, O., manufacturer of the Milburn Electric, has opened a branch factory in Toledo. The new plant is on Summit street, and it is located in the factory building formerly occupied by the Toledo Bending Co.

Jacobs has Marion-Handley—B. F. Jacobs, formerly representative on the Pacific coast of an eastern factory, is now at the head of the recently organized Marion-Handley Sales Co., of Los Angeles, which firm has the southern California and Arizona territory for the Marion-Handley line.

Buys Ohio Tractor—W. H. Houghton, president of the Houghton Sulky Co., purchased at a recent receiver's sale the personal property of the Ohio Tractor Manufacturing Co. for $6,650. Property was sold by Receiver Charles H. Lewis. The company will be reorganized with Ellis M. Houghton as general manager of the motor car plant.

Cardway to South America—The Packard Motor Car Co. is sending Fred Cardway on an extended busines tour of South America, where he will show and demonstrate the Packard Twin Six and also a Packard chainless truck. All the principal countries in South America will be visited by the representative.

Sewell Branch in Pittsburgh—The Sewell Cushion Wheel Co., of Detroit, has opened a branch in Pittsburgh, at 711 First National Bank building, under the management of Mr. E. G. Burley. This makes the thirteenth branch which has been opened by this company, the others being located in New York, Chicago, Philadelphia, Buffalo, St. Louis, Boston, Cleveland, Minneapolis, Rochester, Baltimore, Seattle and Los Angeles.

Take on Territory—The Bond Motor Co., Kansas City, Mo., heretofore distributors of Saxon in the western two-thirds of Missouri, northern and eastern Kansas, has had added to its territory all of Kansas and the northern part of Oklahoma. They will handle the business from Kansas City.

Chase Field Representative—Paul B. Donaldson, formerly connected with the Philadelphia branch of the Chase Motor Truck Co., on August 1 was transferred to the home office organization at Syracuse and will hereafter act as special field representative.

Hastings Joins Empire—Don T. Hastings has joined the forces of the Empire Automobile Co. in the capacity of consulting engineer. Mr. Hastings has had many years' experience with manufacturers, notably the Packard Motor Car Co., General Motors Co., and Hupp Motor Car Co.

Easterly for Petrograd—H. W. Easterly, for several years general manager of the Sheboygan Gas Light Co., Sheboygan, Wis., has resigned to accept a position with the Sterling Motor Truck Co., Milwaukee, as field and sales representative in the Russian Empire, with headquarters in Petrograd.

Briscoe Factory Manager—A. C. Leviston, who was until recently general superintendent of the Chalmers Motor Co., has been appointed factory manager of the Briscoe Motor Corp. Mr. Leviston was also formerly connected with the old Cartercar Co., as works manager and with the old Bush Co. as general superintendent.

Los Angeles Dealers Change Name—The Carlton-Faulkner-Bowles, Inc., is the successor to the Carlton, Faulkner & Bowles Co., Al G. Faulkner, Los Angeles, having retired from the concern which was reincorporated to continue with the Fiat, McFarlan and Jeffery lines. The company has just been appointed southern California distributor of the Stewart truck also.

Buick Promotions—The Buick Motor Co. has promoted the following men: W. J. Browne, who had charge of the assembling plants, is now plant manager of factories Nos. 1 and 4, succeeding Mr. Durham; P. J. Moohn has been made manager of assembling plants, succeeding Mr. Browne; R. E. Benner, who has been research engineer of the company, is promoted to the position of general superintendent; C. B. Durham, who had charge of factory No. 1, has been made general master mechanic of all Buick plants.

Ross Sales Representative—The Ross Automobile Co., of Detroit, has made announcement of the appointment of Ben Rennard as special sales representative.

Walker, Chandler Assistant Engineer—Hiram Walker, formerly with the Enger Motor Car Co., Cincinnati, O., has been appointed assistant engineer of the Chandler Motor Car Co., Cleveland, O.

Kuehn With Cheltenham—Charles Kuehn, for many years connected with the Packard Motor Car Co., advertising department, at the factory in Detroit, has joined the Cheltenham Advertising Agency, of New York.

Overland Branch at Omaha—A direct factory branch for the Willys-Overland Co., under the firm name of Willys-Overland, Inc., has been opened at Omaha, Neb., with J. R. Jamieson, president of the Overland-Omaha Co., in charge.

Federal Promotes Men—V. K. McBride, who has been in the sales department of the Federal Motor Truck Co., Detroit, Mich., for over 2 years, has been apopinted assistant sales manager of the company. H. A. Conlon, formerly a special sales representative of the Federal company in England, has been promoted to the position of field sales manager.

MacInnes Changes Connections—W. J. MacInnes, formerly advertising director, commercial branch of General Motors Co., latterly connected with the sales department of United Motors Co., Winton Motor Co., and motor car editor of the Chicago American, has become connected with the Western Advertising Agency, of Racine, Wis., and Chicago.

Wisconsin Oakland Entertains—The Wisconsin Oakland Co., Milwaukee, distributer of the Oakland in Wisconsin and upper Michigan, recently entertained 125 of its retail dealers at Milwaukee. The afternoon was devoted to a 4-hour cruise on Lake Michigan.

Sales Increase on Coast—The figures secured from twenty of the largest motor car houses in Los Angeles show that July was a record-breaking month for car sales in the territory controlled by the local distributers, namely, southern California and Arizona. Notwithstanding the fact that many of the distributers were just cleaning up on their 1916 models and some of the agents could

not get the cars needed, July was more than 50 per cent ahead of the same month last year. Not one of the entire twenty dealers whose figures were used in arriving at the totals, showed less than 50 per cent increase.

Anderson Southern Contract—The Anderson Motor Co. yesterday closed a contract for 200 cars to be delivered in Tennessee. E. H. Dennison, of Pittsburgh, Pa., has closed the contract as agent for the state of Tennessee and ordered 200 cars for sale in that state.

Ford Uses Mason Plant—The old Mason Motor Car Co. plant in Des Moines has been leased as temporary headquarters for the Ford branch assembly plant for Iowa, which ultimately will be located in a new building. The old Mason plant has about 20,000 feet of floor space. F. B. Norman, from the main plant at Detroit, is in charge, with H. M. Barton as his assistant.

Carbureter Manufacturer Expands—Plans for greatly increasing both the manufacturing and distributing facilities for Browne and Browne-Branford carbureters have culminated in a recapitalization of the Holt-Welles Co., Inc., sole selling agents for the Browne products, an increase from $50,000 to $200,000 in capital having been authorized.

Humphrey Joins Briscoe—S. H. Humphrey, formerly vice-president of the Chalmers Motor Car Co., has been elected vice-president and manufacturing manager of the Briscoe Motor Corp., Jackson, Mich. Mr. Humphrey has been connected with the industry since its inception, starting as a mechanic at the Peerless factory in Cleveland. His first connection with the Briscoe brothers was in 1908, when he went to the Brush company as works manager.

Big Maxwell Shipment—The Lord Motor Car Co., southern California and Arizona distributor of the Maxwell, has 30 carloads or 180 machines on the way to the Pacific coast from the Detroit plant in one order.

Winningham at Hudson—W. L. Agnew, having resigned as advertising manager of the Hudson Motor Car Co., the work of this department is now being looked after by C. C. Winningham, sales manager and director of advertising of the Hudson company.

Milwaukee Packard Builds—The Milwaukee branch house of the Packard Motor Car Co., of Chicago, will be enlarged during the next 60 days by the erection of a 70x60-foot addition, to be used principally for service station and repair shop.

Totten Drowns in River—William C. Totten, president of the Totten Automobile Co., Rock Island, Ill., was drowned while bathing in the Mississippi river. He founded the Totten company 7 years ago and also operated a taxicab company for a number of years.

New Hassler Building—Robert H. Hassler, Inc., Indianapolis, Ind., manufacturer of the Hassler shock absorber for Fords, is building a new factory 300 by 100, the site acquired comprising 5 acres, and the building, land and equipment represent an investment of over $100,000. The plant is under contract to be completed ready for occupancy by October 1.

Harrah Savidge S. M.—W. S. Harrah has been appointed sales manager of the Savidge Co., which in addition to an improved Ford steering device, will put out several other accessories in the near future.

Savidge Changes Name—The Savidge Steering Device Mfg. Co., Indianapolis, Ind., has changed its corporate name to the Savidge Co., and has just announced that hereafter the product will be handled through its own sales organization, instead of through the Meixell Co., which has heretofore handled the selling end.

Addition to National—The National Motor Vehicle Co., Indianapolis, Ind., is making further additions to its plant; a new building 65 by 400 feet, three stories, will be constructed, uniform with other new buildings. A tract has also been purchased immediately east of the present plant to take care of further contemplated additions.

Dale Jeffery Gotham Dealer—John G. Dale, formerly Metropolitan distributor of Simplex cars, has sold the Simplex agency to the Simplex company and has taken on the Jordan motor car. He will retain his present location. The price paid by the Simplex company has not been made public but represented an amount said to be the largest ever paid for a New York agency.

Recent Incorporations

Cleveland, O.—Savage Auto and Repair Co.; capital stock, $5,000; incorporators, W. C. Davies, H. D. Savage, Walter McMahon, Marcus Cohen, M. J. Rowan.

Macomb, Ill.—Irwin-Overland Company; incorporators, Leaton Irwin, C. L. Harrah, W. W. Faries, C. E. Asher. A sales agency will be maintained and a line of supplies and accessories carried.

Milwaukee, Wis.—Wisconsin Magneto Exchange Co.; to succeed to partnership business conducted at 511 Broadway, Milwaukee; capital stock $11,000; incorporators, Adolph Grauer, August D. McIntyre and Nomene McIntyre.

Maplewood, N. Y.—Gardner Taxicab Company; general taxicab business; capital stock $50,000.

Maplewood, N. Y.—Gardner Taxicab Co., to manufacture and deal in motor cars, etc.; capital stock, $50,000; incorporators, Isabel S. Miller, W. W. Jones, Warren Gardner.

Mount Vernon, Ill.—Williamson Auto Co.; capital stock, $2,500; incorporators, Thomas B. Williamson, Charles H. Dumpd, Orley T. Ham.

Norfolk, Va.—Coburn Motor Sales Corp.; capital stock, $50,000; incorporators, T. Gray Coburn, J. T. Darden.

New York—Cross Port-Motor Co., Inc.; to manufacture internal combustion motors, engines, motor cars, patents, etc.; capital stock, $100,000; incorporators, E. J. O'Connell, J. S. Casey, J. J. O'Connell.

New York—Gotham Transportation Co.; motor driven vehicles, accessories; capital stock $50,000; incorporators, G. W. Weaver, A. Frey, J. F. Wiggin.

New York—Tire Co. of Baltimore, Inc.—General tire manufacturing business; capital stock $100,000; incorporators, S. Bernheim, C. A. Weldon, H. H. Jacobson.

Newark, N. J.—Daniel Delaney & Son, to manufacture truck and motor car springs, etc.; capital stock, $125,000.

New York—Mitchell Motors Co., motor cars, engines; capital stock, $500; incorporators, T. Achenbach, J. H. Keim, F. S. Crostry.

New York—Batt Motor Axle Co., motors, axles, etc.; capital stock, $100,000; incorporators, J. McCormick, J. C. Snyder, C. F. Batt.

Philadelphia, Pa.—Gardner Taxicab Co.; capital stock, $50,000; incorporators, Warren Gardner, Isabel S. Miller, William W. Jones.

Richmond, Va.—Amco Motor Co.; capital stock, $500,000; incorporators, A. M. Wolf, A. F. Hansl.

Stanford, Ky.—Bailey Garage Company; capital stock $1,800; incorporators, H. L. Bailey, J. H. Warner and R. L. Collier.

Springfield, Mo.—Overland-Springfield Motor Co.; capital, $10,000, all paid; incorporators, Carl W. A. F and Willis W. Lennhard; to buy, sell and repair motor vehicles of all kinds.

Springfield, Ill.—Overland-Brodhead Co.; capital stock $20,000; incorporators, John Brodhead; J. B. Bolland and Ethel Holtt.

Topeka, Kan.—American Auto Indemnity Co.; incorporators, I. A. Lower, J. C. Helbert, F. L. Ebey, W. T. Lawless, James Wall, C. J. Peterson and John E. Barrett.

Toledo, O.—Oilar-Overland Co., to deal in motor cars; capital stock, $10,000; incorporators, Howard Lewis, Elizabeth H. Watson, S. A. Carter, Frank S. Lewis, and Frank M. Hackett.

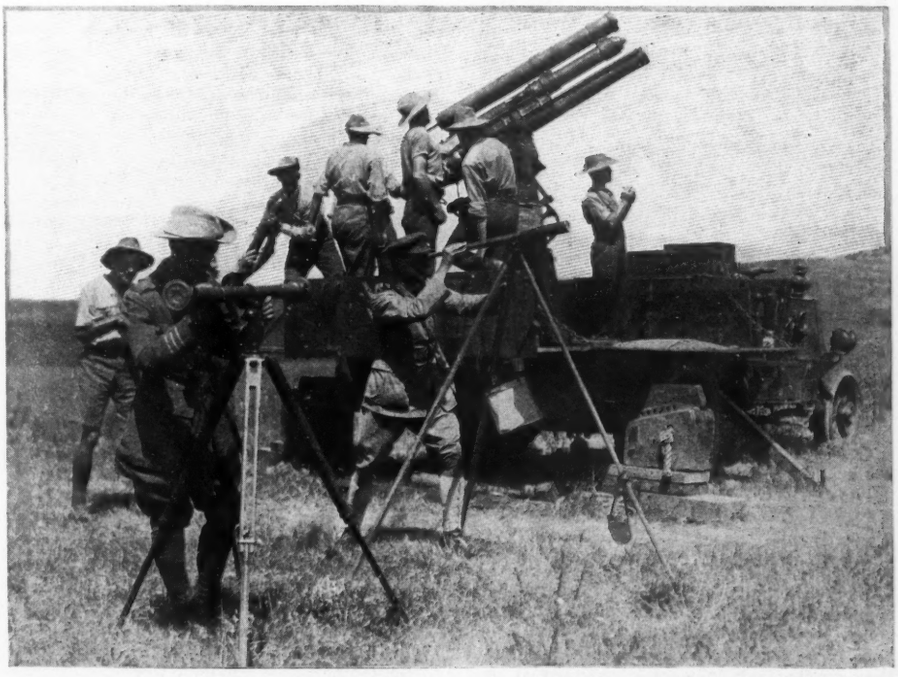
Toledo, Ohio—H. L. Yaryan Motor Co.; capital stock, $10,000; incorporators, H. L. Yaryan, H. T. Yaryan, H. C. Adams, Blanche O'Brien, Nina F. Deavitt.

Toronto, Ont.—Canadian Gasoline Corp.; capital stock $3,000,000.

Toledo, O.—H. L. Varyan Motor Co.; capital stock, $10,000; incorporators, H. L. Varyan and others.

Wilmington, Del.—Motor Car Accessories & Storage Co., to manufacture, sell, store and repair all kinds of motor cars and accessories; capital stock, $5,000; incorporators, F. B. Hansell, G. H. B. Martin, S. C. Seymour.

Youngstown, O.—Mahoning Motor Co., to deal in automobiles and accessories; capital stock, $20,000; incorporators, R. H. Rogers, Myron DeVenne, A. O. Fleming, P. H. Stambaugh, and Louis S. Baldwin.



BRITISH ANTI-AIRCRAFT GUN — The photograph illustrated shows a British anti-aircraft gun on a motor truck in Saloniki. The men in the foreground are range finders, whose duty it is to post the gunners on the exact location of the moving enemy plane. These weapons have brought down a great many scouting planes on all of the allied fronts. The trucks which carry the guns also transport the ammunition.

From the Four Winds

CONVICTS in Road Building—Forty-eight counties in West Virginia employed convicts in building and repairing roads during the year ending June, 1916.

Canadian Bus Line—The city of Walkerville, Ont., will shortly vote on a by-law to grant $15,000 to establish a motor bus line for service in the southern section of the town.

Testing Station for Lights—New York City has established a testing station for lights, where owners may have their lights tested free to discover if they comply with the city ordinances, particularly as to the distance and heighth of focus.

No Night Crawlers in Park—The caterpillar motor trains in Lincoln Park, Chicago, have made their last night trips. Complaints received from motorists by the park commission that the crossing and recrossing of the park drives by these midget sightseeing conveyances at night, was dangerous, brought action from the board.

Canadian Road Congress—Plans for the 1917 Dominion Good Roads Congress to be held in Winnipeg, Man., are already beginning to take shape and very shortly word is expected from that city as to the most suitable date for the convention and the best place in which to hold the meeting and the exhibition.

Drives Cattle by Headlights—Harry Sage, Stockton, Ill., a dealer in cattle, has found a new use for his motor car. During the extremely hot weather of the past month he decided to drive his stock at night in order to avoid prostrations. Turning on his headlights, he was able to drive the herd successfully, the highway being brilliantly illuminated, the cattle following the road with less straying than was the case during the daytime.

NONAGENARIAN BUYS CAR—"You can't teach an old dog new tricks" is a saying as old as the hills. Robert Doak, of Carbondale, Pa., has shattered another adage. He bought himself a birthday present of an Overland, Model 75-B, and it was his ninety-third birthday at that. The bewhiskered old gentleman, born before the days of steam trains, has become a proficient driver.

Los Angeles Show—There has been no date set for the Los Angeles motor car show, but there is a strong sentiment in favor of but one show, instead of two as has been the case previously.

Outing for Providence Children—The directors of the Providence, R. I., Chamber of Commerce, among whose members are many of the motor car dealers, gave the children, who are inmates of various institutions, a motor ride to Crescent Park on August 14.

Electric Fan in Ford—J. W. Haughey, an insurance agent of Topeka, Kan., has equipped his Ford car with a small electric fan, supplied from the battery, which he turns on while prospects encountered on the country road are sitting in the car listening to his sales talk, or while they are riding in still days.

Pennsylvania Good Roads—As a result of the meeting held in the Central Y. M .C. A. in Pittsburgh last March a state-wide Good Roads Association was formed at the capitol in Harrisburg recently. The purpose of the association is to perpetuate Good Roads Day in Pennsylvania and to arouse as much interest and enthusiasm as possible in the vital question of improving the roads in this commonwealth.

One Car for Every Twenty-eight—When Secretary of State Olcott issued Oregon motor car license tag 30,000, he announced the fact that that state has one motor car for every twenty-eight of its people. This is based on a population of 823,000. Thirty-eight per cent of the 30,000 cars are Fords.

County Fair Building—Evidence that the country fair is to feature motors cars is shown by the awarding of the contract for a permanent motor show building on the grounds owned by the Brockton, Mass., Fair Association. The managers have approved plans for a building to cost $25,000 in which motor cars and trucks will be shown. It will be finished in September in ample time to sell space for the October fair week.

Building Concrete Roads—Vermilion county, Ill., breaks records in concrete road construction. On March 17 contracts were awarded by the county mentioned for the longest mileage of concrete roads ever let, nearly 145 miles of paved highway built for permanence, built to outlast the $1,500,000 bond issue that made these roads possible.

Michigan Cars Increase—Michigan car registration for the first 7 months of this year total 140,000 as compared with 114,845 for all of 1915. The record is up to August 1, and indications are that at least 25,000 more new cars will be added to the list before another year starts. During July, 15,000 cars were registered, and August is showing up about at the same rate. Receipts from fees up to July 1 totaled $1,501,089.23.

Tacks on Roads—Car owners at Bloomington, Ill., complain that candidates for public office and others who post placards upon telephone poles and elsewhere along the public highways are often careless in dropping tacks where they are likely to cause punctures to tires. Several car owners recently have met with this experience, and they think that all persons who indulge in this posting practice should show greater concern for the rights of those who drive motor vehicles.

MOTORIZED HOBOES—Two students of Los Angeles, sons of wealthy parents, are now putting up at one of New York's big hotels after having left their home town June 16 without a nickle. In a Chevrolet roadster they bummed their way across country in de luxe style. They first relied on a large assortment of sample spark plugs they carried, which were exchanged at garages for oil and gas. Later they conducted an advertising campaign, distributing literature for hotels. On occasions they have painted signs and even pitched hay for a meal or two.

Coming Motor Events

TRACTOR DEMONSTRATIONS

August 21-25—Bloomington, Ill.
August 28-September 1—Indianapolis, Ind.
September 4-8—Madison, Wis.

SHOWS

September 4-8—Hartford, Conn.
September (date undecided)—Cleveland.
September 25-30—Salem, Ore.
October 14-31—Dallas, Tex.
January 6-13—New York show.
January 13-20—Montreal.
January 27-February 3—Chicago show.
March 3-10—Boston.